12092

BY THE SAME AUTHOR.

Flashlights on Nature.

With 150 Illustrations by FREDERICK ENOCK.
Crown 8vo, cloth extra, **6s.**

"Lovers of natural history will revel in a book which, without any parade, makes science easy."—*Standard.*

"The illustrations are an admirable feature of the book."—*Aberdeen Free Press.*

In Nature's Workshop.

With 100 Illustrations by FREDERICK ENOCK.
Crown 8vo, cloth extra, **3s. 6d.**

"The naturalist, the student, and the 'man in the street' will alike find delight in this excellent volume."—*Liverpool Courier.*

LONDON: GEORGE NEWNES, LIMITED.

The rights of translation and of reproduction are reserved.

PREFACE.

In this little volume I have endeavoured to give a short and succinct account of the principal phenomena of plant life, in language suited to the comprehension of unscientific readers. As far as possible I have avoided technical terms and minute detail, while I have tried to adopt a more philosophical tone than is usually employed in elementary works. I have treated my readers, not as children, but as men and women, endowed with the average amount of intelligence and insight, and anxious to obtain some sensible information about the world of plants which exists all round them. Acting upon this basis, I have freely admitted the main results of the latest investigations, accepting throughout the evolutionary theory, and making the study of plants a first introduction to the great modern principles of heredity, variation, natural selection, and adaptation to the environment. Hence I have wasted comparatively little space on mere structural detail, and have dwelt as much as possible on those more interesting features in the interrelation of the plant and animal worlds which have vivified for us of late years the dry bones of the old technical botany.

My principle has been to unfold my subject by gradual stages, telling the reader one thing at a time, and building up by degrees his knowledge of the subject. My treatment is, therefore, to some extent diagrammatic, especially in the earlier chapters; but I endeavour as I proceed to correct the generalisations and fill in the gaps of the first crude statement. I trust that advanced students who may glance at this little book will forgive me for such concessions to the weaker brethren, especially when they see that at the same time I have ventured to lay before untechnical readers all the latest results of the most advanced botanical research, as far as could be done in so small a compass. I have even made bold to speak at times of "carbonic acid," where I ought strictly to have said "carbon dioxide," and to glide gently over the distinction between hydro-carbons and carbo-hydrates, which could interest none but chemical students. I have been well content to make these trivial sacrifices of formal accuracy in order to find room for fuller exposition of the delightful relations between flowers and insects, birds and fruits, soil and plant, climate and foliage. In one word, I have dwelt more on the functions and habits of plants than on their structure and classification. At the same time I have tried to lead on my reader by gradual stages to the further study of plants in the concrete; and I shall be disappointed if my little book does not induce a considerable proportion of those into whose hands it may fall to pursue the subject further in our fields and woods by the aid of a Flora.

G. A.

THE CROFT, HINDHEAD.
April, 1895.

CONTENTS.

CHAP.		PAGE
I.	INTRODUCTORY	9
II.	HOW PLANTS BEGAN TO BE	14
III.	HOW PLANTS CAME TO DIFFER FROM ONE ANOTHER	26
IV.	HOW PLANTS EAT	35
V.	HOW PLANTS DRINK	57
VI.	HOW PLANTS MARRY	78
VII.	VARIOUS MARRIAGE CUSTOMS	93
VIII.	MORE MARRIAGE CUSTOMS	113
IX.	THE WIND AS CARRIER	135
X.	HOW FLOWERS CLUB TOGETHER	147
XI.	WHAT PLANTS DO FOR THEIR YOUNG	162
XII.	THE STEM AND BRANCHES	176
XIII.	SOME PLANT BIOGRAPHIES	198
XIV.	THE PAST HISTORY OF PLANTS	221

CHAPTER I.

INTRODUCTORY.

I PROPOSE in this volume to write in brief the history of plants, their origin and their development. I shall deal with them all, both big and little, from the cedar that is in Lebanon to the hyssop that springeth out of the wall. I shall endeavour to show how they first came into existence, and by what slow degrees they have been altered and moulded into the immense variety of tree, shrub, and herb, palm, mushroom, and sea-weed we now behold before us. In short, I shall treat the history of plants much as one treats the history of a nation, beginning with their simple and unobtrusive origin, and tracing them up through varying stages to their highest point of beauty and efficiency.

Plants are living things. That is the first idea we must clearly form about them. They are living in just the same sense that you and I are. They were born from a seed, the joint product of two previous individuals, their father and mother. Plants likewise live by eating; they have mouths and stomachs, which devour, digest, and assimilate the food supplied to them. These mouths and stomachs exist in the shape of leaves, whose business it is to catch floating particles of carbonic acid in the air around, to suck such particles in by means of countless lips, and to extract from them the carbon which is the principal food and raw material of plant life. Plants also drink, but, unlike ourselves, they have quite different mouths to eat with and to drink with. They take in their more solid constituent, carbon, with their leaves from the air; but they take in their liquid constituent, water, with their roots and rootlets from the soil beneath them. "More solid," I say, because the greater part of the wood and harder tissues of plants is made up of carbon, in combination with other less important materials; though, when the plants eat this carbon, it is not in the solid form, but in the shape of a gas, carbonic acid, as I shall more fully explain when we come to consider this subject in detail. For the present, it will be enough to remember that *Plants are living things, which eat and drink exactly as we ourselves do.*

Plants also marry and rear families. They have two distinct sexes, male and female—sometimes separated on different plants, but more often united on the same stem, or even combined in the same flower. For flowers are the reproductive parts of plants; they are there for the purpose of producing the seeds, from which new plants spring, and by means of which each kind is perpetuated. The male portions of plants of the higher types are known as *stamens;* they shed a yellow powder which we call *pollen,* and this powder has a fertilising influence on the young seeds or *ovules.* The female portion of plants of the higher types is known as the *pistil;* it contains tiny undeveloped knobs or ovules, which can only swell out and grow into fruitful seeds provided they have been fertilised by pollen from the stamens of their own or some other flower. The ovules thus answer very closely to the eggs of animals. After they have been fertilised, the pistil begins to mature into what we call a *fruit,* which is sometimes a sweet and juicy berry, as in the grape or the currant, but more often a dry capsule, as in the poppy or the violet.

Plants, however, unlike animals, are usually fixed and rooted to one spot. This makes it practically impossible for them to go in search of mates, like birds or butterflies, squirrels or weasels. So they are obliged to depend upon outside agencies, not themselves, for the conveyance of pollen from one flower to another. Sometimes, in particular plants, such as the hazels and grasses, it is the wind that carries the pollen on its wings from one blossom to its neighbour; and, in this case, the stamens which shed the pollen hang out freely to the breeze, while the pistil, which is to catch it, is provided with numberless little feathery tails to receive the passing grains of fertilising powder. But oftener still, it is insects that perform this kind office for the plant, as in the dog-rose, the hollyhock, and the greater part of our beautiful garden flowers. In such cases the plant usually makes its blossom very attractive with bright-coloured petals, so as to allure the insect, while it repays him for his trouble in carrying away the pollen by giving him in return a drop of honey. The bee or butterfly goes there, of course, for the honey alone, unconscious that he is aiding the plant to set its seeds; but the plant puts the honey there in order to entice him against his will to transport the fertilising powder from flower to flower. There is no more fascinating chapter in the great book of life than that which deals with these marriage relations of the flowers and insects, and I shall explain at some detail in later portions of this little work some of the most curious and interesting of such devices.

Again, after the plant has had its flower fertilised, and has set its seed, it has to place its young ones out in the world to the greatest advantage. If it merely drops them under its own branches, they may not thrive at all; it may have impoverished the soil already of certain things which are necessary for that particular kind, owing to causes to be explained hereafter; and even where this is not the case, the surrounding soil may be so fully occupied by other plants that the poor little seedlings get no chance of establishing themselves. To meet such emergencies, plants have invented all sorts of clever dodges for dispersing their seeds, into the nature of which we will go in full in the sequel. Thus, some of them put feathery tops to their seeds or fruits, like the thistle and the dandelion, the willow and the cotton-bush, by means of which they float lightly on the air, and are wafted by the wind to new and favourable situations. Others, again, bribe animals to disperse them, by the allurement of sweet and pulpy fruits, like the strawberry or the orange; and in all these instances, though the fruit or outer coat is edible, the actual seed itself is hard and indigestible, like the orange-pip, or is covered with a solid envelope like the cherry-stone. Numerous other examples we shall see by and by in their proper place. For the present, we have only to remember that plants to some extent provide beforehand for their children, and in many cases take care to set them out in life to the best possible advantage.

Most of these points to which I am here briefly calling your attention are true only of the higher plants, and especially of land-plants. For we must not forget that plants, like animals, differ immensely from one another in dignity, rank, and relative development. There are higher and lower orders. We shall have to consider, therefore, their grades and classes—to find out why some are big, some small; some annual, some perennial; why some are rooted in dry land, while some float freely about in water; why some have soft stems like spinach and celery, while others have hard trunks like the oak and the chestnut. We shall also have to ask ourselves what were the causes which made them differ at first from one another, and to what agencies they owe the various steps in their upward development. In short, we must not rest content with merely saying that the rose is like this and the cabbage like that; we must try to find out what gave to each of them its main distinctive features. We must "consider the lilies, how they grow," and must seek to account for their growth and their peculiarities.

And now let me sum up again these central ideas of our future reading on plants and their history.

Plants are living things; they eat with their leaves, and drink with their rootlets. They take up carbon from the air, and water from the soil, and build the materials so derived into their own bodies. Plants also marry and are given in marriage. They have often two sexes, male and female. Each seed is thus the product of a separate father and mother. Plants are of many kinds, and we must inquire by and by how they came to be so. Plants live on sea and land, and have varieties specially fitted for almost every situation. Plants have very varied ways of securing the fertilisation of their flowers, and look after the future of their young, like good parents that they are, in many different manners. Plants are higher and lower, exactly like animals.

These are some of the points we must proceed to consider at greater length in the following pages.

CHAPTER II.

HOW PLANTS BEGAN TO BE.

Which came first—the plant or the animal?

That question is almost as absurd as if one were to ask, Which came first—the beast of prey, or the animals it preys upon? Clearly, the earliest animals could not possibly have been lions and tigers; for lions and tigers could not begin to exist till after there were deer and antelopes for them to hunt and devour. Now the general connection between animals and plants is somewhat the same in this respect as the general connection between beasts of prey and the creatures they feed upon. For all animals feed, directly or indirectly, upon plants and their products. Even carnivorous animals eat sheep and rabbits, let us say; but then, the sheep and the rabbits eat grass and clover. In the last resort, plants are self-supporting; animals feed upon what the plants have laid by for their own uses. Every animal gets all its material (except water) directly or indirectly from plants. In one word, *plants are the only things that know how to manufacture living material.*

Roughly speaking, plants are the producers and animals the consumers. Plants are like the pine-tree that makes the wood; animals are like the fire that burns it up and reduces it to its previous unorganised condition.

It is a little difficult really to understand the true relation of plants and animals without some small mental effort; yet the point is so important, and will help us so much in our after inquiries that I will venture upon asking you to make that effort, here at the very outset.

If you take a piece of wood or coal, you have in it a quantity of hydrogen and carbon, almost unmixed with oxygen, or at least combined with far less oxygen than they are capable of uniting with. Now put a light to the wood or coal, and what happens? They catch fire, as we say, and burn till they are consumed. And what is the meaning of this burning? Why, the carbon and hydrogen are rushing together with oxygen—taking up all the oxygen they can unite with, and forming with it carbonic acid and water. The carbon joins the oxygen in a very close embrace, and becomes carbonic acid gas, which goes up the chimney and mixes with the atmosphere; the hydrogen joins the oxygen in an equally intimate union, and similarly goes off into the air in the form of steam or watery vapour. Burning, in fact, is nothing more than the union of the carbon and hydrogen in wood or coal with the oxygen of the atmosphere. But observe that, as the carbon and hydrogen burn, they give off light and heat. This light and heat they held stored up before in their separate form; it was, so to speak, dormant or latent within them. Free carbon and free hydrogen contain an amount of *energy*, that is to say of latent light and dormant heat, which they yield up when they unite with free oxygen. And though the carbon and hydrogen in wood and coal are not quite free, they may be regarded as free for our present purpose.

Now, where did this light and heat come from? Well, the wood, we know, is part of a tree which has grown in the open air, by the aid of sunshine. The coal is just equally part of certain very ancient plants, long pressed beneath the earth and crushed and hardened, but still possessing the plant-like property of burning en lighted. In both cases the light and heat, we shall see more fully hereafter, are derived m the sun, our great storehouse of energy. e sunshine fell upon the leaves of the modern c-tree, or of the very antique club-mosses ich constitute coal, and separated in them the bon from the oxygen of carbonic acid, and hydrogen from the oxygen of the water in sap. In each case the oxygen was turned se upon the air in its free form, while the bon and the hydrogen (with a very little ygen and a few other materials) were left in se and almost free conditions in the leaves l wood of the oak or the club-moss. But the nt to which I wish now specially to direct ır attention is this—the sunlight was actually d up for the time being in effecting this aration between the oxygen on the one hand, l the carbon and hydrogen on the other. As g as the plant remained unburnt, the light l heat it received from the sun lay dormant hin it, not as actual light and heat, but as aration between the oxygen and the hydrogen carbon. Coal, indeed, has been well described "bottled sunshine."

More than this; it took just as much light and at from the sun to build up the plant as you get out of the plant in the end by burn- r it.

Now, let us burn our piece of wood or coal, d what happens? Why, particles of oxygen sh together with particles of carbon in the l, and form carbonic acid. How much bonic acid? Just as much as it took originally to build that part of the plant from. Simultaneously, other particles of oxygen in the air rush together with particles of hydrogen in the fuel, and form water, in the shape of steam. How much water? Just as much as it took originally to build that part of the plant from. As they unite, they give out their dormant heat and light. How much heat and light? Just as much as they absorbed in the act of building up those parts of the plant from the sunshine that fell upon them.

In other words, the same quantity of oxygen that was first separated from the carbon and hydrogen reunites with them in the act of burning, and the same amount of heat and light that were required to effect their separation is yielded up again in the act of reunion.

Let us put this point numerically, and I will simplify it exceedingly, so as to make my meaning clearer. Suppose we begin with a particle of carbonic acid and a particle of water in the interior of a green leaf—the carbonic acid swallowed from the air by the leaf, the water brought to it as sap from the roots. Now, under the influence of sunlight, these materials are separated into their component parts. The particle of carbonic acid consists of one atom of carbon, closely locked up with two atoms of oxygen. It takes an amount of sunlight, which we will call A, to unlock this union, and separate the atoms. The oxygen goes off free into the air, and the carbon remains in the leaf as material for building the plant up. Again, the particle of water consists of two atoms of hydrogen, closely locked up with one atom of oxygen. It takes an amount of sunlight, which we will call B, to unlock this union and separate the atoms. The oxygen once more goes off free into the air, and the hydrogen joins in a loose union with the carbon already spoken of. Now, burn the material resulting from these two acts, and what happens? Two atoms of oxygen once more unite with the one atom of carbon, to form a particle of carbonic acid; one atom of oxygen once more unites with the two atoms of hydrogen to form a particle of water, and there is given out in the act of union an amount of light and heat exactly equal to the A and B originally locked up in the act of separating them.

I have now made it clear, I hope, what plant life really is in its final essence. In nature at large, the elements which chiefly compose it—namely, carbon and hydrogen—exist only in very close union with oxygen; the plant is a machine for separating these elements from oxygen under the influence of sunlight, and building them up into fresh forms, whose great peculiarity is that they possess *energy* or dormant motion.

Now the animal is the exact opposite of all this. He is essentially a destroyer, as the plant is a builder. The plant produces; the animal consumes; the plant makes living matter, the animal breaks it down again. He is, in fact, a slow fire, where plant products like grasses, fruits, nuts, or grains, are consumed by degrees and reduced once more to their original condition.

The animal eats what the plant laid by. He also breathes—that is to say, takes oxygen into his lungs. Within his body that oxygen once more unites with the carbon and the hydrogen, and is given out again in union with them as carbonic acid and water. And the energy in the plant food, thus set free within his body, takes the form of animal heat and animal motion—just as the energy set free in the locomotive takes the form of heat and visible movement. Animals are thus the absolute converse of plants; all that the plants did, the animal undoes again.

Briefly to recapitulate this rather dry subject,—the plant is a mechanism for separating oxygen from carbon and hydrogen, and for storing up sun-energy. The animal is a mechanism for uniting oxygen with carbon and hydrogen, and for using the stored-up sun-energy as heat and motion.

And now you can see why it is so absurd to ask, Which came first, the plant or the animal? You might as well ask, Which came first, the coal or the fire? All the living material in the world was first made and laid up by plants. They alone have the power to make living or energy-yielding stuff out of dead and inert water or carbonic acid. They are the origin and foundation of life. Without them there could be no living thing in the universe. It is in their green parts alone that the wonderful transformation of dead matter into living bodies takes place; they alone know how to store up and utilise the sunshine that falls upon them.

All the animal can do is to take the living material the plant has made for him, and to consume it slowly in his own body. He destroys it (as living matter) just as truly as a fire does, and turns it loose on the air again in the dead and inert forms of water and carbonic acid.

It is clear, then, that plants must have come first, and animals afterward. The earliest living beings must needs have been plants—very simple plants; yet essentially plants in this—that they were green, and that they separated carbon and hydrogen from oxygen under the influence of sunlight. It is that above everything that makes true plants; though some degenerate plants have now given up their ancestral habit, and behave in this respect much like animals.

How did the first plant of all come into being?

About that, at present, we know very little. We can only guess that, in the early ages of the world, when matter was fresher and more plastic than now, certain combinations were set up between atoms under the influence of sunlight, which formed the earliest living body. This would be what is called "spontaneous generation." Whether such spontaneous generation ever took place is much disputed; though some people competent to form an opinion incline to believe that it probably did take place in remote times and under special conditions. But it is certain, or almost certain, that in our own days at least spontaneous generation does not take place—perhaps because all the available material is otherwise employed, perhaps because the conditions are no longer favourable. At any rate, we have every reason to suppose that at the present day every living being, whether plant or animal, is the product of a previous living being, its parent, or of two previous living beings, its father and mother.

Why should this be so? Well, if you think for a moment, you will see that it results almost naturally from the other facts we have so far considered. For the plant is a machine for making living matter out of water and carbonic acid, under the influence of sunlight. As long as sunlight, direct or reflected, in sun or shade, falls upon a green plant, the plant goes on taking up carbonic acid from the air by means of its leaves, and water from the earth by means of its roots, and continues to manufacture from them fresh living material. Thus it must be always *growing*, as we say; in other words, the mass of living material must be constantly increasing. Now, it results from this that the plant would grow in time unwieldily large; and in simple types, when it grows very large, it splits or divides into two portions. That is the real origin of what we call REPRODUCTION. In its simplest forms, reproduction means no more than this—that a rather large body, which cannot easily hold together, divides in two, and that each part of it then continues to live and grow exactly as the whole did.

This seems odd and unfamiliar to you, because you are thinking of large and very advanced plants, like a sweet-pea or a potato. But you must remember that we are dealing here with very early and simple plants, and that these early and simple plants consist for the most part of tiny green mites, floating free in water. They are generally invisible to the naked eye, and are in point of fact mere specks of green jelly. Yet it is from such insignificant atoms as these that the great forest trees derive their origin, through a long line of ancestors; and if we wish to understand the larger and more developed plants, we must begin by understanding these their simple relations.

Very early plants, then, floated free in water; and there is reason to believe that for a considerable period in the beginnings of our world there was no dry land at all; the whole surface of the globe was covered by one boundless ocean. At any rate, most of the simplest and earliest forms of life now remaining to us inhabit the water, either fresh or salt; while almost all the higher and nobler plants and animals are dwellers on land. Hence it is not unreasonable to conclude that *life began in the sea,* and only gradually spread itself over the islands and continents.

Floating jelly-like plants would readily reach a size at which it would be convenient for them to split in two—or rather, at which it would be difficult for them to hold together; and most very small floating plants do to this day continue to grow, up to a certain point, and then divide into two similar and equal portions. This is the simplest known form of what we call reproduction. Of course, the two halves into which the plant thus divides itself are exactly like one another; and that gives us the basis for what we call HEREDITY—that is to say, the general similarity between parent and offspring. This similarity depends upon the fact that the two were once one, and when they split or divide each part continues to possess all the qualities of the original mass of which it once formed a portion.

You will observe that I here use the words, parent and offspring. I do so, partly from custom, and partly to show where this reasoning leads us. But in reality, in such very simple plants, neither part of the divided whole can claim to be either parent or child; they are equal and similar. In higher plants, however (as in higher animals), we find that the main portion of the plant continues to live and grow, and sends off smaller portions, known as spores or seeds, to reproduce its species. Here, we may fairly speak of the larger plant as the parent, and of the smaller ones which it detaches from itself as its children or offspring.

The truth is, every gradation exists in nature between these two extreme cases. The different types glide imperceptibly into one another. There is no one point at which we can definitely say, "Here reproduction by splitting or division ceases, and reproduction by eggs, or by spores or seeds begins."

Again, all the earlier and simpler plants are sexless; they simply grow till they divide, and then the two halves continue to exist independently. No two distinct plants or parts of plants are concerned in producing each new individual. But the higher plants, like the higher animals, are male and female. In such cases two distinct individuals combine to form a new one. They are its father and mother, so to speak, and the young one is their offspring. A little grain of pollen produced by the male plant unites with a little ovule or seedlet produced by the female; and from the union of the two springs a fresh young plant, deriving its peculiarities about equally from each of them. How and why this great change in the mode of reproduction takes place is another of the questions we must discuss hereafter; I will only anticipate now the result of this discussion by saying briefly beforehand that plants gain in this way, because greater variety is secured in the offspring, and because the weak points of one parent are likely to be reinforced and made good by the other.

Let us sum up our conclusions in this preliminary chapter:—

Plants are an older type of life than animals. They are the first and most original form of living beings, and without them no life of any sort would be possible. All living matter is manufactured by plants out of material found floating in the air, under the influence of sunlight. How plants first came into existence we do not yet know; but we may suspect that they grew, in very simple and small forms, at a remote period, under conditions which now longer exist. It is almost certain that the f plants were jelly-like specks, floating freely water. They must have been green, and m also have possessed the essential plant-powe building up fresh living material when sunli fell upon them. This power implies the ot power of reproduction, that is to say of splitt up into two or more similar parts, each of wh continues to live and grow like the original bo From such simple and very primordial pla all other and higher forms are most lik descended.

CHAPTER III.

HOW PLANTS CAME TO DIFFER FROM ONE ANOTH

All plants are not now alike. Some are tr some herbs; some are roses, some butterc Yet we have a certain amount of reason believe that they are all descended from one the same original ancestor; and we shall see and by that we can often trace the vari stages in their long development. They di immensely. Some of them are more advan and more complex than their neighbours; s are small and low, while others are tall strong; some, like nettles and grasses, h simple and inconspicuous flowers, while oth like lilies and orchids, have beautiful and complicated blossoms, highly arranged in s ways as to attract and entice particular ins to visit and fertilise them. Again, some seem, as it were, very low and uncivilised, while there are others which display, so to speak, all the latest modern inventions and improvements.

The question is, How did they thus come to differ from one another? What made them vary in such diverse ways from the primitive pattern?

In order to understand the answer which modern science gives to this question, we must first glance briefly at certain early steps in the history of the process which we call creation or evolution.

The earliest plants, we saw, were in all probability mere tiny green jelly-specks, floating free in water, and taking from it small quantities of dissolved carbonic acid, which they manufactured for themselves into green living material when sunlight fell upon them. Now we shall have to consider another peculiarity of plants (and of animals as well) before we can thoroughly understand the first stage in the upward process which leads at last to the pine and the lily, the palm and the apple.

Plants are made up of separate parts or elements, known as *cells*, each of which consists of a thin cell-wall, usually containing living material. The very simplest and earliest plants, however, consist of a single such cell apiece;

cross-fertilisation, as it is called, is good fo plants, producing very strong and vig seedlings, the young ones so set would the best chance of flourishing and survivin the Struggle for Existence. Thus the flo which made most honey would be ofte visited and crossed, so that they would become very numerous. Again, if they pened to have bright leaves near the ho they would be most readily discriminated, oftenest visited those seeds succeed in growing each year. In the first year, that poppy will have produced ten new poppy plants; the year after, each of those ten will have produced ten more, making the total 100; in the third year, they will be 1,000; in the fourth, 10,000; and so on in the same progression till in a very few years the whole world would simply be full of poppies. And similarly with animals. If every egg in a cod's roe developed into a mature fish, the sea would soon be one solid and compact mass of cod-fish.

Why doesn't this happen? Because every other kind is producing seeds or eggs at about the same rate, and every one of them is fighting against the other for its share of light and food and soil and water. The stronger or better-adapted survive, while the weaker or less-adapted go to the wall, and are starved out of existence. At first, to be sure, it sounds odd to talk of a Struggle for Life among plants, which seem too fixed and inert to battle against one another. But they *do* battle for all that. Each root is striving with all its might to fix itself underground in the best position; each leaf and stem is struggling hard to overtop its neighbour, and secure its fair share of carbon and of sunshine. When a garden is abandoned, you can very soon see the result of this struggle; for the flowers, which we only keep alive by weeding—that is to say, by uprooting the sturdier competitors—are soon overgrown and killed out by the weeds—that is to say, by the stronger and better-adapted native plants of the district.

This, then, is the nature and meaning of these two great principles. *The Struggle for Life* means that more creatures are produced than there is room in the world for. *Natural Selection* (or *Survival of the Fittest*) means that among them all, those which happen to be best adapted to their particular circumstances oftenest succeed and leave most offspring.

By the action of the two great principles in question (which affect all life, animal or vegetable) the world has been gradually filled with an immense variety of wonderful and beautiful creatures, all ultimately descended (as modern thinkers hold) from the selfsame ancestors. The simple little green jelly-speck, which is the primitive plant, has given rise in time to the sea-weeds and liverworts, then to the mosses and ferns, then to the simplest flowering plants, thence to the shrubs and trees, and finally to all the immense wealth and variety of fruits, flowers, and foliage we now see around us.

The rest of this book will consist mainly of an exposition of the results brought about among plants by *Variation*, the *Struggle for Life*, and *Survival of the Fittest*. But before we go on to examine them in detail, I shall give just a few characteristic instances which show the mode of action of these important principles.

There is a pretty wild flower in our hedges called a red campion, or "Robin Hood." Now, a single red campion produces in a year three thousand seeds. But there are not three thousand times as many red campions this year as last, nor will there be three thousand times as many more again next season. Indeed, if an annual plant had only two seeds, each of which lived and produced two more, and so on continually, in twenty years its descendants would amount to no less than a million. From all this it necessarily results that a Struggle for Existence must take place among plants; they fight with one another for the soil, the rain, the carbon, the sunshine.

Again, take such a wild flower as this very red campion. Why has it light pink petals? The reason is, to attract the insects which fertilise it. Flowers, in which the pollen is carried by the wind, *never* have brilliant or conspicuous blossoms; but flowers which are fertilised by insects have almost always coloured petals to tell the insects where to find the honey. How did this come about? In this way, I imagine: Many plants produce a sweet juice on their leaves—for example, the common laurel. This juice, which is probably of no particular use to them, is very greedily eaten by insects. Now suppose some flower, by accident at first, happened to produce such sweet juice near its stamens, which (as we saw) are the organs for making pollen, and also near its pistil, which contains its young seeds or ovules. Then insects would naturally visit it to eat this sweet juice, which we commonly call honey. In eating it, they would dust themselves over with the floury pollen, by pure accident, and they would carry some of it away with them on their heads and legs to the next flower they visited. Chance would make them often rub off the pollen and fertilise the flower; and as such cross-fertilisation, as it is called, is good for the plants, producing very strong and vigorous seedlings, the young ones so set would have the best chance of flourishing and surviving in the Struggle for Existence. Thus the flowers which made most honey would be oftenest visited and crossed, so that they would soon become very numerous. Again, if they happened to have bright leaves near the honey, they would be most readily discriminated, and oftenest visited. So, in the long run, it has come about that almost all the flowers fertilised by insects produce honey to allure them, and have brilliant petals to guide their allies to the honey. That, in fact, is what beautiful flowers are for — to attract the fertilising bees and butterflies to visit and impregnate the various blossoms.

Take one more case—or, rather, the same case, extended a little further. The red campion flowers by day, and is fertilised by butterflies; therefore it is pink, because pink is an attractive colour in the daylight; and it is scentless, because its colour alone is quite enough to attract sufficient insects. But it has a close relation, the white campion, which flowers by night only, and lays itself out to be visited by moths in the twilight. Why is this kind white? Because no other colour is seen so well in the dusk; a red or pink blossom would then be almost invisible. Moreover, the white campion is heavily scented, as are almost all other night-flowering blossoms, like the jasmine, the tuberose, the stephanotis, and the gardenia.

many more again next season. Indeed, if an annual plant had only two seeds, each of which lived and produced two more, and so on continually, in twenty years its descendants would amount to no less than a million. From all this it necessarily results that a Struggle for Existence must take place among plants; they fight with one another for the soil, the rain, the carbon, the sunshine.

Again, take such a wild flower as this very red campion. Why has it light pink petals? The reason is, to attract the insects which fertilise it. Flowers, in which the pollen is carried by the wind, *never* have brilliant or conspicuous blossoms; but flowers which are fertilised by insects have almost always coloured petals to tell the insects where to find the honey. How did this come about? In this way, I imagine: Many plants produce a sweet juice on their leaves—for example, the common laurel. This juice, which is probably of no particular use to them, is very greedily eaten by insects. Now suppose some flower, by accident at first, happened to produce such sweet juice near its stamens, which (as we saw) are the organs for making pollen, and also near its pistil, which contains its young seeds or ovules. Then insects would naturally visit it to eat this sweet juice, which we commonly call honey. In eating it, they would dust themselves over with the floury pollen, by pure accident, and they would carry some of it away with them on their heads and legs to the next flower they visited. Chance would make them often rub off the pollen and fertilise the flower; and as such cross-fertilisation, as it is called, is good for the plants, producing very strong and vigorous seedlings, the young ones so set would have the best chance of flourishing and surviving in the Struggle for Existence. Thus the flowers which made most honey would be oftenest visited and crossed, so that they would soon become very numerous. Again, if they happened to have bright leaves near the honey, they would be most readily discriminated, and oftenest visited. So, in the long run, it has come about that almost all the flowers fertilised by insects produce honey to allure them, and have brilliant petals to guide their allies to the honey. That, in fact, is what beautiful flowers are for — to attract the fertilising bees and butterflies to visit and impregnate the various blossoms.

Take one more case—or, rather, the same case, extended a little further. The red campion flowers by day, and is fertilised by butterflies; therefore it is pink, because pink is an attractive colour in the daylight; and it is scentless, because its colour alone is quite enough to attract sufficient insects. But it has a close relation, the white campion, which flowers by night only, and lays itself out to be visited by moths in the twilight. Why is this kind white? Because no other colour is seen so well in the dusk; a red or pink blossom would then be almost invisible. Moreover, the white campion is heavily scented, as are almost all other night-flowering blossoms, like the jasmine, the tuberose, the stephanotis, and the gardenia.

Observe the numerous points of similarity: these are white; all are sweet-scented; all moth-fertilised. Why is this? Because scent helps to show the moth the way to flower when there is hardly enough light for l to see the white petals. Thus every plant adapted to its particular station in life, and adaptation is the result of the Struggle Existence, and Survival of the Fittest.

Briefly put, whatever variation helps the pl in any way in any particular place, or at particular time, is likely to give it an ex chance in the fight, and is therefore reprodu in all its descendants.

So that is how plants began to vary.

To sum up. Plants grow, because they k on continually taking in carbon and hydro from the world outside them, under the fluence of sunlight. They multiply, beca when they have attained a certain size t split up to form two or more individuals. T struggle for life with one another, because m are produced than can find means of livelihc And the struggle results in Survival of the Fitt

Or, looked at in another light. Pl multiply, and as they multiply by division new ones on the whole resemble their parer this is the law of *Heredity*. But they do exactly resemble them in every detail; thi the law of *Variation*. And as some variati are to the good, and some to the bad, the be survive and produce young like themse oftener than the worse do; this is the lav *Natural Selection*.

CHAPTER IV.

HOW PLANTS EAT.

We saw in the last chapter how and why plants came to differ from one another, but not why they came to be divided into well-marked groups or kinds, such as primroses, daisies, cabbages, oaks, and willows. In the world around us we observe a great many different sorts of plants, not all mixed up together, so to speak, nor merging into one another by endless gradations, but often clearly marked off by definite lines into groups or families. Thus a primrose is quite distinct from a crocus, and an oak from a maple. For the present, however, I do not propose to go into the question of how they came to be divided into such natural groups. I will begin by telling you briefly how plants eat and drink, marry and rear families, and then will return later on to this problem of the *Origin of Species*, as it is called, and the pedigrees and relationships of the leading plant families.

First of all, then, we will inquire, *How Plants Eat*. And in this inquiry I will neglect for the most part the very early and simple plants we have already spoken about, and will chiefly deal with those more advanced and complicated types, the flowering plants, with which everybody is familiar.

Plants Eat with their Leaves. The leaves are, in fact, their mouths and stomachs.

expanded surface, and this surface horizontally, so as to catch as much as possib of the sunlight that falls upon it. Its business to swallow carbonic acid from the air, and dige and assimilate it under the influence of sunligh And as different situations require differer treatment, various plants have leaves of ver different shapes, each adapted to the habits an manners of the particular kind that produc them. The difference has been brought abo by Natural Selection.

What does the leaf eat? Carbonic aci There is a small quantity of this gas alway floating about dispersed in the air, and plant fight with one another to get as much as possibl of it. Most people imagine plants grow out the soil. This is quite a mistake. The portio of its solid material which a plant gets out the soil (though absolutely necessary to it) i hardly worth taking into consideration, numc rically speaking; by far the larger part of it substance comes directly out of the air a carbon, or out of the water as hydrogen an oxygen. You can easily see that this is so i you dry a small bush thoroughly, leaves an all, and then burn it. What becomes of i in such circumstances? You will find tha the greater part of it disappears, or goes o into the atmosphere; the carbon, uniting with oxygen, goes off in the form of carbonic acid, while the hydrogen, uniting with oxygen, goes off in the form of steam or vapour of water. What is there left? A very small quantity of solid matter, which we know as ash. Well, that ash, which returns to the soil in the solid condition, is practically almost the only part the plant got from the soil; the rest returns as gas and vapour to the air and water, from which the plant took them. You must never forget this most important fact, that *plants grow mainly from air and water*, and hardly at all from the soil beneath them. Unless you keep it firmly in mind, you will not understand a great deal that follows.

Why, then, do gardeners and farmers think so much about the soil and so little about the air, which is the chief source of all living material? We shall answer that question in the next chapter, when we come to consider What Plants Drink, and what food they take up dissolved in their water.

Carbonic acid, though itself a gas, is the chief source of the solid material of plants. How do plants eat it? By means of the green leaves, which suck in floating particles of the gaseous food. Their eating is thus more like breathing than ours: nevertheless, it is true feeding: it is their way of taking in fresh material for building up their bodies. If you examine a thin slice from a leaf under the microscope, you will find that its upper surface consists of a layer of cells cushion of water-cells you come again upon

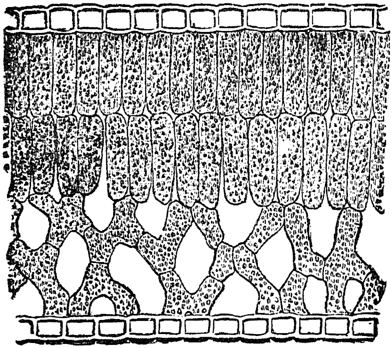


FIG. 1.—A THIN SLICE FROM A LEAF, SEEN UNDER THE MICROSCOPE. On top are water-cells, which suck in carbonic acid. Beneath these are green cells, which assimilate it under the influence of sunlight. The spongy lower portion is used for evaporation.

firm layer of closely-packed green cells, filled with living green-stuff, which take the carbonic acid in turn from the water-cells, and manufacture it forthwith into sugars, starches, and other materials of living bodies. The lowest spongy part evaporates unnecessary water, and so helps to keep up circulation.

The plant has often many hundred leaves, that is to say, many hundred mouths and stomachs. Why do plants need so many when we have but one? Because they cannot move, and because their food is a gas, diffused in minute quantities through all the atmosphere. They have to suck it in wherever they can find it. And what do they do with the carbonic acid when once they have got it? Well, to answer that question, I must tell you a little more about what the ordinary green leaf is made of, and especially about the green-stuff in its central cells.

Now what is this green-stuff? It is the true ife-material of the plant, the origin of all the iving matter in nature. You and I, as well as the lants themselves, are entirely built up of living elly which this green-stuff has manufactured nder the influence of sunlight. And the mateial that does this is such an important thing in he history of life that I will venture to trouble ou with its scientific name, CHLOROPHYLL. Vhen sunlight falls upon the Chlorophyll or reen-stuff in a living leaf, in the presence of arbonic acid and water, the chlorophyll (or, to e quite accurate, the living matter or protoplasm ith chlorophyll embedded in it) at once proceeds set free the oxygen (which it turns loose upon e air again), and to build up the carbon and ydrogen (with a little oxygen) by various stages to a material called starch. This starch, as you now, possesses *energy*—that is to say, latent ht and dormant heat and movement, because can eat it and burn it within our bodies. her materials, hydro-carbons and carbo-hyates, as they are called, are made in the same leaves, or to combine with other important materials of which I shall speak hereafter, in order to form fresh living chlorophyll, or rather protoplasm with chlorophyll in it.

Now we know what leaves are for; and you can easily see, therefore, that they are by far the most essential and important part of the entire plant. Most plants, in fact, consist of little else than colonies of leaves, together with the flowers which are their reproductive organs. We have next to see *What Shapes various Leaves assume*, and what are their reasons for doing so.

The leaf has, as a rule, to be broad and flat, in order to catch as much carbon as possible; it has also usually to be expanded horizontally to the sunlight, so as to catch and fix it. For this reason, most leaves that can raise themselves freely to the sun and air are flat and horizontal. But in very crowded and overgrown spots, like thickets and hedgerows, the leaves have to fight hard with one another for air and sunlight; and in such places particular kinds of plants have been developed, with leaves of special forms adapted to the situation. The fittest have survived, and have assumed such shapes as natural selection dictated.

Where the plants are large and grow freely upward, with plenty of room, the leaves are

12092

B5

A4

usually broad and expanded, as in the tobacco-plant and the sunflower. Where the plants grow thick and close in meadows, the leaves are mostly long and narrow, like grasses. In overgrown clumps and hedgerows they are generally much subdivided into numerous little leaflets, as is the case with most ferns, and also with herb-Robert, chervil, milfoil, and vetches. In these last cases, the plant wants to get as much of the floating carbonic acid, and of the sunlight, as it can; and therefore it makes its leaves into a sort of divided network, so as to entrap the smallest passing atom of carbon, and to intercept such stray rays of broken sunlight as have not been caught by the taller plants above it. In almost all cases, too, the leaves on the same plant are so arranged round the stem and on the branches as to interfere with one another as little as possible; they are placed in an order which allows the sunshine to reach every leaf, and which secures a free passage of air between them.

An interesting example of the way some of these principles work out in practice is afforded us by a common little English pond-weed, the water-crowfoot. This curious plant grows in streams and lakes, and has two quite different types of leaves, one floating, and one submerged. The floating leaves have plenty of room to develop themselves freely on the surface of the pond; they loll on the top, well supported by the mass of water beneath; and, as there is little competition, they can get an almost unlimited supply of carbonic acid and sunshine. Therefore, they two types may be aptly compared to lungs and gills, only in the one case it is carbonic acid and in the other case oxygen, that the highly-dissected organs are seeking in the water.

As a general rule, when a plant can spread its leaves freely about through unoccupied air, with plenty of sunlight, it makes them circular, or nearly so, and supports them by means of a stem in the middle. This is particularly the case with floating river-plants, such as the water-lily and the water-gentian. But even terrestrial plants, when they can raise their foliage easily into unoccupied space, free from competition, have similar round leaves, supported by a central leaf-stalk, as is the case with the familiar garden annual popularly (though erroneously) known as nasturtium. (Its real name is Tropæolum.) On the other hand, when a plant has to struggle hard for carbon and sunlight in overgrown thickets, or under the water, it has usually very much subdivided leaves, minutely cut, again and again, into endless segments. Submerged leaves invariably display this tendency.

But that does not conclude the whole set of circumstances which govern the forms and size of leaves. Not only do they want to eat, and to

They are, as it were, the skeleton or framework of the leaf; and in what are commonly known as "skeleton leaves" the living cell-stuff between has been rotted away, so as to display this harder underlying skeleton or framework. It is composed of specially hardened, lengthened, and strengthened cells, and is intended, not only to do certain living work in the plant (as we shall see hereafter), but also to form a supporting scaffolding. The material of which ribs or beams are composed is called "vascular tissue"—a not very well chosen name, as this material has only a slight analogy to what is called the vascular system (or network of blood-vessels) in an animal body. It is much more like the bony skeleton. Similarly, the ribs themselves are usually called veins—a very bad name again, as they are much more like the bones of a wing or hand; they are mainly there for support, as a bony or wooden framework, though they also act for the conveyance of sap or water.

And now we are in a position to begin to understand the various shapes of leaves as we see them in nature. They depend most of all upon certain inherited types of ribs or so-called veins, and these types are usually pretty constant technically called, cellular tissue.

There are two chief ways of arranging the ri or veins in a leaf, which may be distinguished a the *finger-like* and the *feather-like* methods (i

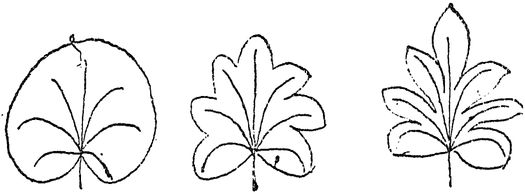


FIG. 2.—FINGER-VEINED LEAVES. The veins are the sam in the three leaves, but they differ in the amount t which they are filled in.

technical language, *palmate* and *pinnate*). I the *finger-like* plan the ribs all diverge from common point, more or less radially. In th *feather-like* plan the ribs are arranged in oppo site pairs along the sides of a common line o midrib. Yet even these two distinct plan merge into one another by imperceptible de grees, as you can see if you look at the accom panying diagram.

Now let us take first the *finger-veined* typ (Fig. 2). Here, if all the interstices of the rib are fully filled out with cellular tissue, we get roundish leaf like that of the so-called nasturtium. But if the ribs project a little at the edge —in other words, if the cellular tissue does not quite fill out the whole space between them—we get a slightly indented leaf, like that of the scarlet geranium or the common mallow. If the unfilled spaces between the ends of the ribs are much greater, then the ribs project into marked points or lobes, and we get a leaf like that of ivy.

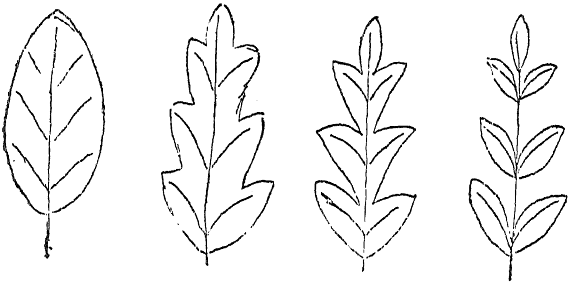


FIG. 3.—FEATHER-VEINED LEAVES. The four leaves have similar veins, but are differently filled in.

Carry the starving of the cellular tissue a little further still, and we have a deeply-indented leaf like that of the castor-oil plant. Finally, let the spaces unfilled go right down to the common centre from which the ribs radiate, and we get a divided or compound leaf, like that of the horse-chestnut, with three, five, or seven separate leaflets. (See Fig. 5, No. 1.)

Similarly with the *feather-veined* type (Fig. 3); the spaces between the ribs may be more or less filled with cellular tissue in any degree you

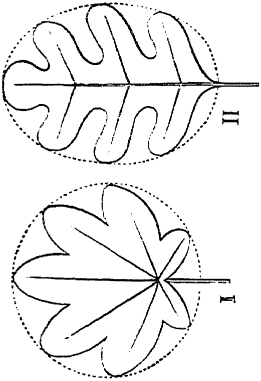


FIG. 4.—TWO LEAVES: I. Finger-veined, but lobed, like scarlet geranium. II. Feather-veined, but lobed, like oak.

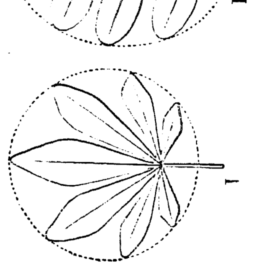


FIG. 5.—TWO LEAVES: I. Fi
but divided into separate l
horse-chestnut. II. Feat
but divided into separate l
vetch.

senna. A little more pointed, and less filled out at the tips, it becomes like argel. When filled out than others is simply this: it depends upon the freedom of their access to air and sunlight. I do not mean the freedom of access of the particular leaf or the particular plant, but the average ancestral freedom of access in the kind they belong to. Each kind has adapted itself, as a rule, to certain situations for which it has special advantages, and it has learnt by the teaching of natural selection to produce such leaves as best fit its chosen site and habits. Where access to carbon and sunlight is easy, plants usually produce very full round leaves, with all the interstices between the ribs filled amply in with cellular tissue; but where access is difficult, they usually produce rather starved and unfilled leaves, which consist, as it were, of scarcely covered skeletons (Figs. 4 and 5). This last condition is particularly observable in submerged leaves, and in those which grow in very crowded situations.

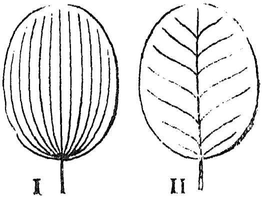
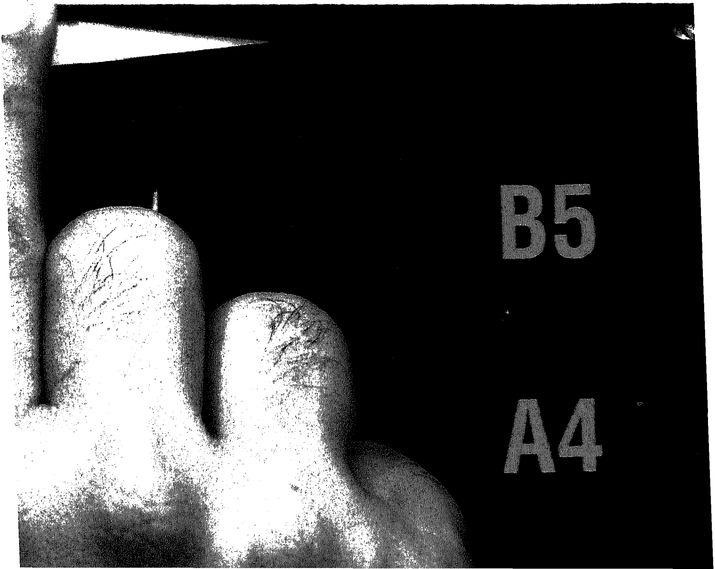


FIG. 6.—I. Parallel veins, as seen in one great group of plants, the lilies. II. Branching veins, as seen in another great group, the trees and herbs of the usual type.

parallel (Fig. 6). In this type, the ribs do not form a radiating network at all, but run straight, or nearly so, through the leaves. Examples of it occur in almost all grasses, and in tulips, daffodils, lily of the valley, and narcissus. Leaves of this sort have seldom any leaf-stalk; they usually rise straight out of the ground, more or less erect, and their architectural plan is generally quite simple. They are seldom toothed, and hardly ever divided into deeply-cut segments or separate leaflets.

A few more peculiarities in the shapes of leaves must still be noted, and a few words used in describing them must be explained very briefly. When the leaf consists all of one piece, no matter how much cut up and indented at the edge, it is said to be "simple"; but if it is divided into distinct leaflets (as in Fig. 5), it is called "compound." If the edge is unindented all round (as in Fig. 6), we say the leaf is "entire"; if the ribs form small projections at the edge (as in Fig. 4), we call it "toothed"; if the divisions are deeper, we say it is "lobed"; and when the lobes are very deeply cut indeed, we call it "dissected." Thus, in order to describe accurately the shape of a leaf, we need only say which way it is veined or ribbed—whether finger-



and they are almost always more or less heart-shaped at the base, as in convolvulus and black briony. The leaves of forest trees, on the other hand, tend to be what is known as *ovate* in shape, like the beech and the poplar; while those of the lime are a little one-sided, in order that each leaf may not overshadow and rob its neighbour. This one-sidedness is even more markedly seen in the hot-house begonias. Some leaves, again, are minutely subdivided into leaflets twice or three times over; such leaves are said to be doubly or trebly compound. But if you study plants as they grow (and this book is written in the hope that it may induce you to do so), you will generally be able to see that the shapes and peculiarities of leaves have some obvious reference to their place in the world, and their habits and manners.

I have spoken so far mainly of quite central and typical leaves, which are arranged with a single view to the need for feeding. But plants are exposed to many dangers in life besides the danger of starvation, and they guard in various ways against all these dangers. One very obvious one is the danger of being devoured by grazing animals, and, to protect themselves holly-bush through the action of Variation an Natural Selection. For holly grows chiefly i rough and wild spots, where all the green leave are liable to be eaten by herbivorous animal If, therefore, any plant showed the slighte tendency towards prickliness or thorniness, would be more likely to survive than its u protected neighbours. And indeed, as a matt of fact, you will soon see that almost all t bushes and shrubs which frequent common such as gorse, butcher's broom, hawthor blackthorn, and heather, are more or less spin though in most of these cases it is the branche not the leaves, that form the defensive elemen Holly, however, wastes no unnecessary materi on defensive spikes; for though the lower leave within reach of the cattle and donkeys, are ve prickly indeed, you will find, if you look, th the upper ones, above six or eight feet from t ground, are smooth-edged and harmless. The upper leaves stand in no practical danger being eaten, and the holly therefore takes ca to throw away no valuable material in protecti them from a wholly imaginary assailant.

Often, too, in these prickly plants we c trace some memorial of their earlier histo Gorse, for example, is a peaflower by family, member of the great group of "papilionaceous," or butterfly-blossomed, plants, which includes the pea, the bean, the laburnum, the clover, and many other familiar trees, shrubs, and climbers. It is descended more immediately from a special set of trefoil-leaved peaflowers, like the clovers and lucernes; but, owing to its chosen home on open uplands, almost all its upper leaves have been transformed for purposes of defence into sharp, spine-like prickles. Indeed, the leaves and branches are both prickly together, so that it is difficult at first sight to discriminate between them. But if you take a seedling gorse plant you will find that in its early stages it still produces trefoil leaves, like its clover-like ancestors; and these leaves are almost exactly similar to those of the common genista so much cultivated in hot-houses. As the plant grows, however, the trefoil leaves gradually give place to long and narrow blades, and these in turn to prickly spines, like the adult gorse-leaves. Hence we are justified in believing that the ancestors of gorse were once genistas, bearing trefoil leaves; and that later, through the action of natural selection, the prickliest among them survived, till they acquired their existing spiny foliage. In every case, indeed, *young plants tend to resemble their earlier ancestors*, and only as they grow up acquire their later and more special characteristics.

And now I must add one word about the origin of leaves in general. Very simple plants, we saw, consist of a single cell, which is not of particular parts to do better what the primitive cell did for itself but badly. Above the very simple plants which consist of a single cell come other plants, which consist of many cells placed end on end together, as in the case of the hair-like water-weeds; and above these again come other and rather higher plants, in which the cellular tissue assumes the form of a flat and leaf-like blade, as in many broad seaweeds. None of these, however, are called leaves in the strict sense, because they consist of cells alone, without any ribs or supporting framework. The higher types, however, like ferns and flowering plants, have such ribs or frameworks, made of that stiffer and tougher material called vascular tissue. This is the most general distinction that exists between plants; the higher ones are known as Vascular Plants, including all those with true leaves, such as the common trees, herbs, and shrubs, and the ferns and grasses—in fact, almost all the things ever thought of as plants by most ordinary observers; the lower ones are known as Cellular Plants, and include the kinds without true leaves or vascular tissue, such as the seaweeds, fungi, and microscopic plants only recognised as a rule by botanical students.

forth, down to the hairs that protect the surface, or the glands that produce honey to attract the fertilising insects. To the end, however, all parts of the plant retain the power to eat carbonic acid, if necessary; so that many higher plants have no true leaves, but use portions of the stem or branches for the purpose of feeding. Any part of the plant which contains the active living green-stuff, or chlorophyll, can perform the functions of a leaf. In very dry or desert places, leaves would be useless, because their flat and exposed blades would allow the water within to evaporate too readily. Hence most desert plants, like the cactuses, and many kinds of acacias and euphorbias, have no true leaves at all; in their place they have thick and fleshy stems, often very leaf-like in shape, and curiously jointed. These stems are covered with a thick, transparent skin or epidermis, to resist evaporation, and are protected by numerous stinging hairs or spines, which serve to keep off the attacks of animals. Stems of this type are used as reservoirs of water, which the plant sucks up during the infrequent rains; and as they contain chlorophyll, like leaves, they serve in just the same way as swallowers and digesters of carbonic acid.

merely a leaf, but also at the same time a flower, a seed, a root, a branch, and everything. In other words, in very simple plants a single cell does rather badly everything which in more advanced and developed plants is better done by distinct and highly-adapted organs. The whole evolution of plants consists, in fact, in the telling off of particular parts to do better what the primitive cell did for itself but badly. Above the very simple plants which consist of a single cell come other plants, which consist of many cells placed end on end together, as in the case of the hair-like water-weeds; and above these again come other and rather higher plants, in which the cellular tissue assumes the form of a flat and leaf-like blade, as in many broad seaweeds. None of these, however, are called leaves in the strict sense, because they consist of cells alone, without any ribs or supporting framework. The higher types, however, like ferns and flowering plants, have such ribs or frameworks, made of that stiffer and tougher material called vascular tissue. This is the most general distinction that exists between plants; the higher ones are known as Vascular Plants, including all those with true leaves, such as the common trees, herbs, and shrubs, and the ferns and grasses—in fact, almost all the things ever thought of as plants by most ordinary observers; the lower ones are known as Cellular Plants, and include the kinds without true leaves or vascular tissue, such as the seaweeds, fungi, and microscopic plants only recognised as a rule by botanical students.

The higher plants, then, have for the most part special organs, the leaves, told off to do work for them as mouths and stomachs; while other organs are told off to do other special work of their own—as the roots to drink, the flowers to reproduce, the fruit and seeds to carry on the life of the species to other generations, and so forth, down to the hairs that protect the surface, or the glands that produce honey to attract the fertilising insects. To the end, however, all parts of the plant retain the power to eat carbonic acid, if necessary; so that many higher plants have no true leaves, but use portions of the stem or branches for the purpose of feeding. Any part of the plant which contains the active living green-stuff, or chlorophyll, can perform the functions of a leaf. In very dry or desert places, leaves would be useless, because their flat and exposed blades would allow the water within to evaporate too readily. Hence most desert plants, like the cactuses, and many kinds of acacias and euphorbias, have no true leaves at all; in their place they have thick and fleshy stems, often very leaf-like in shape, and curiously jointed. These stems are covered with a thick, transparent skin or epidermis, to resist evaporation, and are protected by numerous stinging hairs or spines, which serve to keep off the attacks of animals. Stems of this type are used as reservoirs of water, which the plant sucks up during the infrequent rains; and as they contain chlorophyll, like leaves, they serve in just the same way as swallowers and digesters of carbonic acid.

greater its tendency to make the stem share in the work of feeding, or even to get rid of foliage altogether. In Australia, however, most of the forest trees, like the eucalyptuses, have got over the same difficulty in a different way; they arrange their leaves on the stem so as to stand vertically to the sun's rays, instead of horizontally, which saves evaporation, and makes the woodland almost entirely shadeless. Many of these Australian trees, however, have no true leaves, but use in their place flattened green branches.

Some plants are annuals, and some perennials. When annuals have flowered and set their seed they wither and die. But perennials go on for several seasons. Most of them, however, in cold climates at least, shed their leaves on the approach of winter. But they do not lose all the valuable material stored up in them. Trees and shrubs withdraw the starchy matter into a special layer of the bark, where it remains safe from the winter frosts, and is used up again in spring in forming the new foliage. This new foliage is usually provided for in the preceding season. If you look at a tree in late autumn, after the leaves have fallen, you will see that it is covered by little knobs which we know as *buds*. These buds are the foliage of the coming season. The outer part consists of several layers of dry brown scales, which serve as an overcoat to protect the tender young leaves within from the chilly weather. But the inner layers consist of the delicate young leaves themselves, which are destined to sprout and grow as soon as spring comes round again. Even the scales, indeed, are very small leaves, with no living material in them; they are sacrificed by the plant, as it were, in order to keep the truer leaves within snug and warm for the winter. Nor do the autumn leaves fall off by pure accident; some time before they drop the tree arranges for their fall by making a special row of empty cells where the leaf-stalk joins the stem or branch; and when frost comes on, the leaf separates quietly and naturally at that point, as soon as the valuable starchy and living material has been withdrawn and stored in the permanent layers of the bark for future service.

Smaller and more succulent plants do not thus withdraw their living material into the bark in autumn; but they attain much the same end in different manners. Thus lilies and onions store the surplus material they lay by during the summer at the base of their long leaves, and the swollen bases thus formed produce what we call a *bulb*, which carries on the life of the plant to the next season. Other plants, like the common English orchids, store material in underground tubers; while others, again, and by far the greater number, so store it in the root, which is sometimes thick and spendthrifts which were satisfied to live for the fleeting moment only. The soil of our meadows in winter is full of tubers, bulbs, and root-stocks; while our shrubs and trees carry over their capital from season to season in their living bark, secure from injury. In one way or another all our perennial plants manage to tide their living green-stuff, or at least its raw material, by hook or by crook, over the dangers of winter.

I have given so much space to the subject of leaves because, as you must see, the leaf is really the most important and essential part of the entire plant—the part for whose sake all the rest exists, and in which the main work of making living material out of lifeless carbonic acid and water is concentrated.

Let us sum up briefly the main facts we have learned in this long chapter.

Plants eat carbonic acid under the influence of sunlight. They store up the solar energy thus derived in starches and green-stuff in their own bodies. Very simple plants, which float freely in water, eat and drink with all portions of their surface. But higher plants eat with organs. These organs are known as and are the parts where the chief busi- the plant is transacted.

f is an expanded mass of cells, containing reen-stuff, supported on a tougher frame- r rib-like skeleton. Leaves take in car- eid by means of tiny absorbing mouths, exist on their upper surface; and they ose most of the oxygen, by the aid of t, building up the carbon into starch, ydrogen from the water supplied by the them. Leaves are of different shapes, ing to the work they have to do for the n different situations. Where carbon and t abound they are round, or nearly so; carbon and sunlight are scanty, or much ted for, they are more or less divided into sections.

CHAPTER V.

HOW PLANTS DRINK.

ave now learnt that plants really eat for st part with their leaves. They grow, on hole, out of the air, not, as most people to fancy, out of the soil. Yet you must oticed that farmers and gardeners think a deal about the ground in which they plant , and very little, apparently, about the air d them. What is the reason for this s neglect of the real food of plants, and urious importance attached to the mould they root in?

their growth and development. What they eat through their leaves is far the greatest in amount; but what they drink through their roots is nevertheless indispensable for the production of that living green-stuff, protoplasm with chlorophyll, which, as we saw, is the original manufacturer and prime maker of all the material of life, either vegetable or animal.

Plants have roots. These roots perform for them two or three separate functions. They fix the plant firmly in the soil; they suck up the water which circulates in the sap; and they also gather in solution certain other materials which are necessary parts of the plant's living matter.

The first and most obvious function of the root is *to fix the plant firmly in the soil it grows in*. Very early floating plants, of course, have no roots at all; they take in water and the dissolved materials it contains, with every part of their surface equally, just as they take in carbonic acid with every part of their surface equally. They are all root, all leaf, all flower, all fruit. But higher plants tend to produce different organs, which have become specially

adapted by natural selection for special purposes. If you sow a pea or bean you will find at once that the young seedling begins from the very first to distinguish carefully between two main parts of its body. In one direction, it pushes downward, forming a tiny root, which insinuates itself with care among the stones and soil; in the other direction, it pushes upward, forming a baby stem, which gradually clothes itself with leaves and flowers.

The tip of the root is the part of the plant which exercises the greatest discrimination and ingenuity, so much so that Darwin likened it to the brain of animals. For it goes feeling its way underground, touching here, recoiling there, insinuating little fingers among pebbles and crannies, and trying its best by endless offshoots to fix the plant with perfect security. Large trees, in particular, need very firm roots, to moor them in their places, and withstand the force of the winds to which they are often subject. After every great storm, as we know, big oaks and pines may be seen uprooted by the power of this invisible but very dangerous enemy.

The root, however, does not serve merely to anchor the plant to one spot, and secure it a place in which to grow and feed; it also *drinks water*. The hairs and tips of the root absorb moisture from the soil; and this water circulates freely as sap through the entire plant, dissolving and carrying with it the starches and other materials which each part requires for its growth and nourishment (Figs. 7, 8, and 9). Without

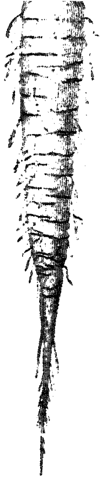


FIG. 7.

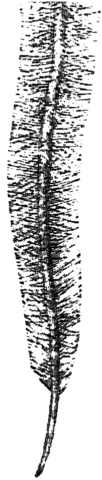


FIG. 8.

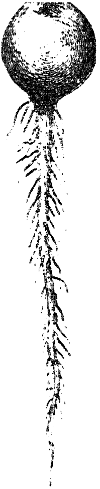


FIG. 9.

Fig. 7. ROOT OF THE CARROT. Fig. 8. ROOT OF THE FROGBIT, FLOATING IN WATER. Fig. 9. ROOT OF THE RADISH. The small hair-like ends drink in water and dissolved food-salts.

of fixing the plant and drinking water, however, roots perform a third and almost more important one in *absorbing the other needful materials of plant life from the soil about them.* They drink, not water alone, but other things dissolved in it.

What are these other things? Well, the answer to that question will fairly round off our first rough idea of the raw materials that life is made up from. We saw already that plants eat carbon and hydrogen from the air and water; out of these they manufacture a large number of compounds, such as starches, oils, sugars, and so forth, all of which contain a little oxygen, but far less than the amount contained in the carbonic acid and water from which they are manufactured. These useful materials, however, though possessing energy, that is to say the power of producing light and heat and motion, are not exactly live-stuffs; in order to make out of them the living green matter of leaves, chlorophyll, or the living cell-stuff of all bodies, animal or vegetable, protoplasm, we must have *a fourth element, nitrogen;* and that element is supplied by the roots in solution.

So now you see the full importance of the roots; they add to the oils and starches manufactured in the leaves that mysterious body, nitrogen, which is necessary in order to turn these things into protoplasm and chlorophyll.

A few other things besides nitrogen are also needed by the plant from the soil; the most important of these are sulphur and phosphorus. The plant, however, does not take in these substances in their free or simple form, as nitrogen, sulphur, and phosphorus, but in composition, as soluble nitrates, sulphates, and phosphates.

Now, I am not going to trouble you with a long chemical account of how the plant combines these various materials—a thing about which even chemists and botanists themselves know as yet but very little. It will be enough to say here that the plant builds them up at last into an extremely complex body, called *protoplasm;*

and this protoplasm is the ultimate living matter, the "physical basis of life;" the thing without which there could be no plants or animals possible.

What is protoplasm—this mysterious stuff, which builds up the bodies of plants and animals? It is a curious transparent jelly-like substance, full of tiny microscopic grains, and composed of carbon, hydrogen, oxygen, nitrogen, and sulphur. Sometimes it is almost watery, sometimes half-horny, but as a rule it is waxy or soft in texture. It is very plastic. Its peculiar characteristic is that it is restlessly alive, so to speak; seen under a microscope, it moves about uneasily, with a strange streaming motion, as if in search of something it wanted. It is, in point of fact, the building-material of life; and out of it the living parts of every creature that lives, whether animal or vegetable, are framed and compounded.

But it is plants alone that know how to make protoplasm, or other organic matter, direct from the dead material around them. Animals can only take living matter ready-made from plants, and burn it up again by reunion with oxygen in their own bodies. The plant manufactures it. The animal destroys it. Chlorophyll bodies or the active green-stuff of leaves is a special modification or variety of protoplasm; and chlorophyll alone possesses the power to manufacture new energy-yielding and living material, under the influence of sunlight, from the dead and inert bodies around it. The materials which it thus produces are afterwards worked up by the plant, together with the nitrogen, sulphur, and phosphorus supplied by the roots, into fresh starch and fresh protoplasm, containing fresh chlorophyll. These the animal may afterwards eat, either in the form of leaves like grass, or in the form of seeds or fruits, like corn, rice, or bananas.

The tiniest primitive one-celled plant contains protoplasm and chlorophyll (though a few degenerate plants, like fungi, have none of the living green-stuff, and can make no new living material for themselves, but depend, like animals, upon the industry of others). Every living cell of every plant contains protoplasm; a cell without any is dead and lifeless. Protoplasm, in short, is *the only living material we know;* and its life constitutes the larger life of the wholes compounded of it.

Well, now you are in a position to see why the farmer and the gardener attach so much importance to the soil, and so little, apparently, to the air and the sunlight. The reason is that the air is everywhere; you get it for nothing; but the soil costs money, and, when cultivated, it requires to be supplied from time to time with fresh stores of the particular materials the plants take from it.

Let me give two simple parallel cases. A fire is made by the combination of two sorts of fuel—coal and oxygen. One is just as necessary for fire-making as the other. But we buy coal dear, and we neglect to take oxygen into consideration accordingly. The reason is that oxygen exists in abundance everywhere; so we don't have to buy it. If we paid a pound a ton for it, as we do with coal, we should very soon remember how necessary a part it is of every fire. Even at present we are obliged to provide for its free admission by the bars of the grate, and by checking or regulating its ingress we can slacken or quicken the burning of the fire.

Or, to take another analogy, oxygen is just as necessary to human beings and other animals as food and drink are. But, as a rule, we get oxygen everywhere in such great abundance that we never think of taking it into practical consideration. Still, in the Black Hole of Calcutta, the unhappy prisoners thoroughly realised the full value of oxygen, and would gladly have paid its weight in gold for the life-giving element.

Now, carbonic acid, on which plants mainly live, is not so common or so abundant a gas as oxygen; but still, it exists in considerable quantities in the air everywhere. So most plants are able to get almost as much as they need of it. Nevertheless, submerged plants, and plants that grow in very crowded places, seem to compete hard with one another for this aerial food; and in certain cases they appear to live, as it were, in a very Black Hole of Calcutta, so far as regards the supply of this necessary material. In farms and gardens, however, the farmer takes care that every plant shall have plenty of room and space—in other words, free access to sunlight and carbonic acid. He "gives the plants air," as he says, not knowing that he is really supplying them with their aerial food-stuff. He does this by keeping down weeds—by ploughing, by digging, by hoeing, or tilling. Indeed, what do we really mean by cultivation? Nothing more than destroying the native vegetation of a place, in order to make room for other plants that we desire to multiply. We plough out the grasses and herbs that occupy the soil; we sow or plant thinly seeds or cuttings of corn or vines or potatoes that we desire to propagate. We give these new plants plenty of space and air—in other words, free access to sunlight and carbonic acid. And that is the fundamental basis of cultivation—to keep down certain natural plants of the place, in order to give free room to others.

But as the crop-plants require to root themselves, the farmer naturally thinks most of the soil they root in—which he has to buy or rent, while the carbonic acid comes freely to him, unperceived, with the breath of heaven. Where water is scarce, as in irrigated desert lands, the farmer recognises quite equally the importance of water. But he never recognises the true importance of carbonic acid. That is why most people wrongly imagine that plants grow out of the soil, not out of the air. Still, when we burn them, the truth becomes clear. The portion of the plants derived from air and water goes off again into the air in the act of burning: so too does the nitrogen: the remaining portion derived direct from the soil is only the insignificant residue returned to the soil as ash when we burn the plant up.

Nevertheless, the farmer often needs to supply certain raw materials to the soil for the plants he cultivates. These raw materials are called *manures;* they are mostly rich in nitrates and phosphates; and as they are usually the only things directly supplied to plants by human agency—the carbonic acid and water being supplied by wind and rain in the ordinary course of nature—they help to strengthen the popular misapprehension that plants grow directly out of the soil. Manures consist chiefly of compounds of nitrogen, phosphorus, and potash. These are the things of which the plants take most from the soil; and when the crops are cut down and carried away, it becomes necessary to restore them. This is generally done by means of farmyard manure, bones, or guano. Most manures are really the remains or droppings of animals; so that when we lay them on the soil, we are merely returning to it in another form what the animal took from it when he eat the plants up.

All plants, however, do not equally exhaust the soil of all necessary materials. Some require one sort of food, and others another. That is why farmers have recourse to what is called *rotation of crops*, so as to follow up one sort of plant in a field by another, whose needs are different. Thus corn is alternated with swedes or turnips. Virgin soil will produce crops for several seasons together without the need for manuring; but when many crops have been cut from it in succession, the earth gets exhausted of nitrates and phosphates, and then it becomes necessary to manure and to rotate the crops in the ordinary manner.

But in nature crops are *not*, as a rule, removed from the soil; they die and wither, and return to it for the most part whatever they took from it. The dead birds and insects, and the droppings of animals, are sufficient manure for the native woodland. Still, even in nature, certain plants more or less exhaust the soil of certain valuable materials; and therefore natural selection has secured a sort of roundabout rotation of crops in a way of which I shall have more to say hereafter. Many plants, for example, which greatly exhaust the soil, have winged or feathery seeds; and these seeds are carried by the wind to fresh spots, where they alight and root themselves, in order to escape the exhausted soil in the neighbourhood of their mothers. Other plants send out *runners*, as they are called, on long trailing branches, which root at a distance, and so start fresh lives in unexhausted places. Yet others have tubers, which shift their place from year to year; or they push forth underground suckers, which become new plants at a distance from the parent. All these are different natural ways for obtaining what is practically rotation of crops; nature invented that plan millions and millions of years before it was discovered by European farmers.

Moreover, nature sometimes even goes in for deliberate manuring. Plants like buttercups and daisies, that live in ordinary meadow soils, to be sure, get enough nitrogen and sulphur and other such constituents from the mould in which they are rooted. But in very moist

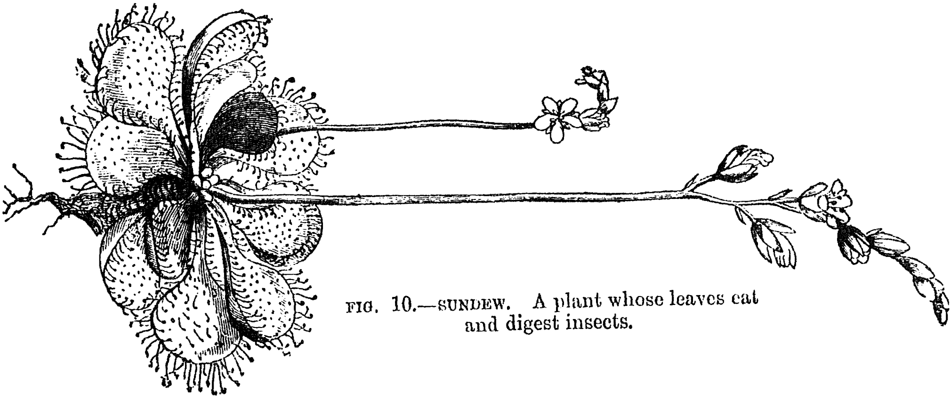


FIG. 10.—SUNDEW. A plant whose leaves eat and digest insects.

and boggy soils there is generally a lack of these necessary earth-given elements of protoplasm; and natural selection has therefore favoured any device in the plants which grow in such places for obtaining them elsewhere. This they do as a rule by catching insects, killing them, sucking their juices, and using them up as manure for manufacturing their own protoplasm and chlorophyll. Our pretty little English *sundew* is one of these cruel and perfidious plants (Fig. 10). Its leaves are round, and thickly covered with small red hairs, which are rather bulbous at the end, and very sticky. The bulbous expansions, in point of fact, are small red glands, which exude a viscid digestive liquid. When a small fly alights on the leaf, attracted by the smell of the sticky fluid, he is caught and held by its gummy mass; the hairs then at once bend over and clutch him, pouring out fresh slime at the same time, which very shortly envelopes and digests him. In the course of a few hours the leaf has sucked the poor victim's juices, and used them up in the manufacture of its own protoplasm.

Many other insect-eating plants exist in the marshy soils of other countries. One of the best-known is the *Venus's fly-trap* of tropical or subtropical North America. In this curious plant the leaf is divided into two portions, one of which forms a jointed snare for catching insects. It is hinged at the middle; and when a fly lights upon it, the two edges bend over upon him, and the bristles on the margin interlock firmly. As long as the insect struggles case they inhabit places where the marshy and waterlogged soil is markedly wanting in nitrogen compounds. Insect-eating leaves are thus a device to supply the plant with nitrogen by means of its foliage, in circumstances where the roots prove powerless for that purpose.

Simpler forms of the same sort of habit may be seen in many other familiar plants. Thus our English *catchflies* and several other of our common weeds have sticky glandular stems, which exude a viscid secretion, by whose aid they catch and digest flies. This is the beginning of the insect-eating habit, more fully evolved by natural selection in marsh-plants like sundew, and especially in larger subtropical types like the Venus's fly-trap. If you collect English wild-flowers you will soon perceive that a great many of them have sticky glands on the summit of the stem, near the flowering heads; and this is useful to them, because the flowers and seeds are particularly in want of nitrogenous matter for the pollen and ovules and the development of the seed. In short, though plants get their nitrogen mainly by means of the roots, they often lay in a supplementary store by their stems and their foliage.

Our common English teasel shows us the beginnings of another form of insect-eating, which is highly developed in certain American plant puts forth long strings of living proto into the water, which suck up the decaying juices of these insects, and use them for the manufacture of more protoplasm and chlorophyll. In this case, water is used both as a trap and as a solvent; the insects are first drowned in the moat, and then allowed to decay and digest themselves in it.

Teasel, however, is but a simple example of this method of insect-catching. Several American marsh-dwellers, collectively known as *pitcher-plants*, carry the same device a great deal further. They are far more advanced and developed water-trap setters. The Canadian *side-saddle plant* allures insects into its vase-shaped leaves, which are filled with sugar and water. This is just the same plan which we ourselves employ to catch flies when we trap them in a glass vessel by means of a sweetened and sticky liquid. The pitchers are formed by leaves which join at the edges; they are attractively coloured, so as to allure the flies; and they secrete on their walls a honeyed liquid, which entices the victim to venture further and further down the fatal path. But the inner sides of the vase are set with stiff downward-pointing hairs, which make it easy to go on, but impossible to crawl back again. So the flies creep

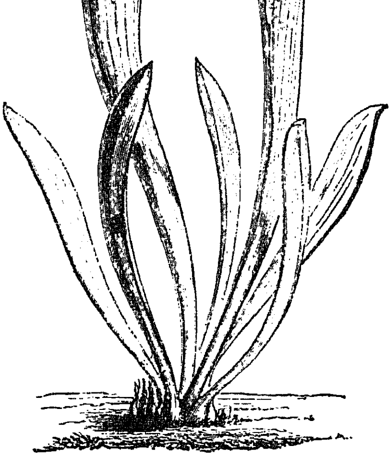


FIG. 11.—AN AUSTRALIAN PITCHER PLANT WHICH EATS INSECTS.

and are drowned and digested. I have found these plants often by the sides of Canadian bogs, with a whole seething mass of festering and

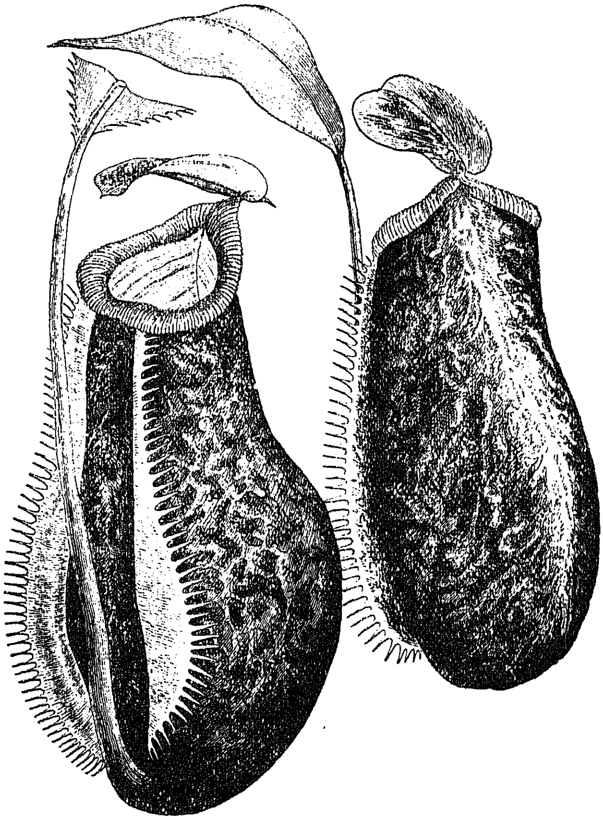


FIG. 12.—INSECT-EATING PITCHERS OF THE MALAYAN NEPENTHES.

are prevented from escaping by strong recurved hooks; and these hooks are so powerful that at times they have been known even to capture small birds which had incautiously entered. This may seem curious, but it is not odder than the fact that our own English *bladderwort*, a water plant with pretty yellow flowers, which grows in sluggish streams, has submerged bladders that supply it with manure, not only from water-beetles, larvæ, and other insects, but also from trout and other young fry of freshwater fishes. I may add that while the sundew and other live-insect catchers have to digest their prey, the water-trap makers save themselves that additional trouble and expense by macerating and soaking it till it reaches the condition of a liquid manure, ready dissolved for absorption, and easy to assimilate.

Thus we see that while roots are the chief organs for absorbing nitrogenous matter, they are often supplemented in special circumstances by leaves and stems. Moreover, in many cases leaves also supply the plant with water. On the other hand, roots often fulfil yet another function, by storing up food for the plant from one season to another. It is true this is still more often done by underground stems, but the distinction between the two is very technical, and I do not think I need trouble you here with it. Large trees with solid trunks usually lay by their starch and other valuable materials over winter in a peculiar living layer of the bark; and here it is on the whole fairly free from danger. Still, even in trees the lower part of the bark is often nibbled by such animals as rabbits; and to prevent this mischance most smaller plants bury their rich food-stuffs underground during the cold season. For whatever will feed a young plant or a growing shoot will also just equally feed an animal. Hence the frequency with which plants make hoards of their collected food-stuffs underground, for use next season. The potato is a well-known instance of such underground hoards; the plant lays by in what are technically subterranean branches a supply of food-stuff for next season's growth. These branches are covered with undeveloped buds, which the farmer calls "eyes"; and from each of these eyes (if the potato is left undisturbed, as nature meant it to be) a branch or stem will start afresh next season. It will use up the starch and other foodstuffs in the potato, till it reaches the light; and there it will begin to develop green chlorophyll, and to make fresh starch for itself, and young leaves and branches.

An immense number of plants thus lay by underground stores of food for next season's use. Such are the carrot, the beet, and the to wait till they have collected enough material in the same year to flower upon. Hyacinths, tulips, daffodils, snowdrops, crocuses, and the various kinds of squills and jonquils are familiar examples of plants which lay by in one year material for the next year's flowering season. But our wild flowers do the same thing quite as much, though less obtrusively. Our earliest spring buttercup is the bulbous buttercup, which has a swollen root-stock, full of rich material; and this enables it to flower very soon indeed, while the fibrous-rooted meadow-buttercup, which closely resembles it in most other respects, has to wait a month later, and then to raise a much taller stem, in order to overtop the summer grasses, which by that time have reached a considerable height. Still earlier, however, is another buttercup-like plant, the lesser celandine, which has material laid by in little pill-like tubers; and these have given it its curious old English name of pilewort. Other early spring wild-flowers are the wood anemone and marsh-marigold, with rich and thick almost tuberous rootstocks; the bulbous wild hyacinth, the tuberous meadow orchid, and the common arum, or "lords and ladies," with its starchy root, very rich in food-stuffs. Indeed, in every case where a plant flowers very early in spring, you may be sure the material for its flowering was laid up by the plant in the previous year—that it is really rather a case of delayed than of very early flowering.

This is especially true of trees, like the blackthorn or the flowering almond, where the flower-buds are usually formed over winter, and only fully developed in the succeeding spring. The same thing happens with gorse; only here, a few bushes always break into bloom in October or November, while others burst spasmodically into blossom whenever a warm and sunny spell occurs in January or February. The remaining bushes are covered through the winter with hairy brown buds, and burst out in early spring into golden masses of scented blossom. A like arrangement also occurs in many catkins, which are the flowers of certain trees; the catkins of the birch and the alder, for example, are always formed in early autumn, though they only break into bloom with recurring warmth in March or April.

We have travelled away so far from our original question of *How plants drink*, that a summary of this chapter is even more necessary than usual.

Plants drink by means of roots. But they take up by them, not only water, which is their and therefore become insect-eating or flesh-eating. Soils get exhausted at times of nitrates, phosphates, and other necessary materials of plant-life. The farmer meets this difficulty by manuring, and by rotation of crops. Nature meets it by dispersion of seeds. Roots, however, have other functions besides drinking water and sucking up with it certain dissolved materials; the chief of these other functions are fixing the plant securely in the ground, and affording a safe place of winter storage for starches and other surplus food-stuffs. Many plants die down almost entirely, above ground, in winter, and keep their raw material in underground reservoirs, most of which are stem-like rather than root-like. Animals, however, find out these subterranean reserves, and prey upon them; hence the plants often secure their hoard by nauseous tastes or other protective devices.

CHAPTER VI.

HOW PLANTS MARRY.

We next come to what is perhaps the most fascinating chapter of all in the life-history of plants—the chapter which tells us how they marry and are given in marriage.

In order that you may fully understand this curious and delightful subject, however, I shall have to begin by telling you a few preliminary points less interesting in themselves, and, I fear, at times not a little troublesome.

Flowers are the husbands and wives of plants. And in some plants the sexes are as fully separated as in birds or beasts; when once you know them, you can distinguish at sight a male from a female flower as readily as you can distinguish a bull from a cow, or a peacock from a peahen (Fig. 13). But in other cases the sexes are muddled up in the same blossom or on the same plant in a way that makes it rather difficult to understand their true nature without a little pains and some close attention.

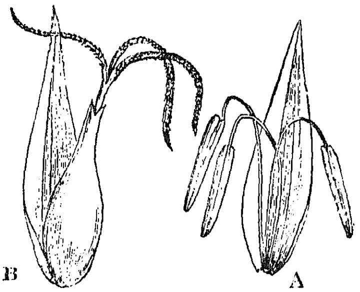


FIG. 13.—A, MALE, & B, FEMALE FLOWER OF A SEDGE, MUCH MAGNIFIED. The sexes are here quite distinct and unlike.

So we must go back a bit for light to the lower plants. Here we find no flowers at all, and in the very lowest cases of any nothing in the least resembling a blossom. Very simple plants, in fact, have two ways of reproducing.

s, when a single cell divides in
n two others; a somewhat less
vhen a single cell breaks sud-
roduces from itself a whole
ones. In both these ways,
s no trace of *sex;* only one
ncerned in the process; the
her, perhaps, but certainly not

pond-weeds, however, which
slightly higher plants in the
le of being than the single-
led floating types, show us the
st beginnings of something like
nt-marriage. These hair-like
tle weeds consist each of a single
read or string of cells, placed
d on end together, like beads
pearls in a necklet, and con-
ining green chlorophyll. You
n find them in almost any stag-
nt pond in spring, where they
ing to the side in soft greenish
oss-like or velvety masses. But
you examine one slimy string
der a microscope, you will
e a curious thing often hap-
the threads of two such hair-like
y grow side by side, two of the
metimes range themselves just
another, with their cells facing
en each opposite pair of cells
a little at the point where they
and *b* in the figure), till at last

they join and coalesce with o
in the figure). The content
into another (at *e*), and the
egg (*f*), which lies quiet for
buds out into a new thread o
division. In this strange p
beginning of sex—the first
animal marriages.

What is the meaning and g
the plants act thus? That qu
quite understand, perhaps; b
in part at least its reason. I
to be kept, as it were, perpetu
fresh; it cannot afford to los
its plasticity. If it does, it
and dies. To prevent this
death of all things, plants
invented all sorts of curiou
example, the protoplasm of
times breaks out of the cell-w
a process which is called "
growing young again. It lies
its free condition, and then b
new wall afresh for itself.
process of breaking out to ha
a new lease of life, as we ou
a trip abroad or change of
occupation. However this
at least that the union of two
a fresher, stronger, and mo
one than can be produced by
single cell. In some way
plant or animal reaches ma
at the limit of its own gr

ier young by so combining
own species.
e pond-weeds the two uniting
y similar. They are not dis-
and female. Neither of them
r than the other; neither of
ve or more vigorous than its
the higher plants a marked
y exists between the two cells
e new individual—a difference
sex now appearing. One of
, and more active; it is called
en cell. The other is larger,
passive; it is called a *female*
is to say in plain English, a
e nature of the ovule is such
w out into a seed or young
en united with and fertilised
more active and lively pollen-

in the higher plants always
-grain and the ovule. These
as stamens and pistils (Fig.
ally separate individuals, or
. The stamen is the father
peak, and the pistil its mother.
saying, I know; and, in order
erstand it, I must begin by
r point about the plant which
some extent studiously con-
It is this—each higher plant
single individual as a commu-

will help you to understand

---

this difficult paradox. I kn
but, if only you will face it, i
of light in due time on parts
must consider hereafter. So
close. A hive is a communit
the most part of workers, w
neither male nor female. Th
we say; and their main work
the whole hive, including themselves and the grubs or larvæ which are the young of the species. But, in addition to these workers, the hive has a queen, who is the only perfect female, or mother, and who lays the eggs from which the
larvæ are produced; and it
drones, who are the males of th
fathers of the larvæ. Thus we
city, as it were, consisting of
single female, and a whole bo
feeder neuters.

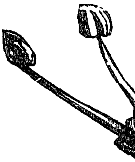


FIG. 15.—A FLO
REMOVED. Ou
which produce
is the pistil,
ovules or you

Now, a higher plant, like a
take a particular example), is ju
or joint community. The leave
is a distinct and almost self-
vidual, are its workers and fe

o, the leaves are neuters—
es nor true females. They feed
l from them new leaves are
uced in the buds and at the
s. This is called the sexless
duction, and it is essentially
ay in which the single-celled
le animal divides itself sexlessly
re little plantlets or animals.
to this sexless way, the plant
times produces other sorts of
sexual individuals, and these
ump, flowers. But flowers are
ughout. They consist of certain
, the stamens, which answer to
f certain female individuals, the
, which answer to the queen or
produce the ovules or little eggs
A cherry-tree is thus a plant-
consisting for the most part of
s, but also at certain times of
ale and female members, whose
ound fresh swarms, as it were
seeds which are the basis and
colonies.
rse one great difference between
t, and that is that in the hive
re separate and distinct, while
are combined on a single stem,
join them. In this respect
like a branch of coral, which
umber of distinct animals or
y a core of stony material, and
f connecting matter. Yet the

difference between the leaves
not so great as at first sight ap
each leaf does not as a rule liv
often capable of doing so if oc
single leaf of stonecrop, sep
parent plant, will root itself
fresh colony; and in some plan
a single fragment of a leaf, if p
is capable of growing out into
In other cases small leaves dro
as bulbils, and root and grow
again, young plants sprout ou
of old leaves to form new co
though the leaf is not usually
it sometimes is, and it can ofte
frequently gives rise in a sexl
plant colonies. A graver diffi
plant differs from the hive in b
connected and subordinated i
stem and root (which bind and
water and nitrogenous matter,
elaborate the starch and prot
chief food-stuffs. Even this di
is less grave than it seems, if w
the queen bee and the lar
dependent upon the workers
protection. A plant, in short
various forms of leaves, ver
together for mutual service,
specialised in various ways a
for particular functions.

And now we are in a positio
work the flower has to do in

f special and peculiar leaves,
fathers and mothers to the
re to be born future plant
colonies.
simplest form, consists of a
single carpel—that is to say,
af-like organ, told off for the
en; or of one leaf or leaf-like
the production of young seeds
s as simple as that do actually
often a flower is much more
ing of several stamens and
s well as of other protective
es, often highly coloured and
h surround or envelop these

iliar flowers, as we actually
f this last more complex type;
itself several male and several
s. The male individuals are
hich generally consists of two
called the *anthers*, and a rather
upport, known as the filament.
duals are *carpels*, each of which
of a sort of sack or folded leaf,
ore tiny seeds or *ovules*.
t at all what *you* mean by a
ainly not; and half the flowers
rning's walk you do not take
l, and pass by unrecognised.
een or inconspicuous blossoms
ttles, oaks, and sedges, as well
pines, the dog's mercury, the
hazel. What *you* mean most

by a flower is a mass of red
conspicuously arranged abou
organs. The petals form, in
popular notion of a flower—
point of view of science they are
important, and are commonly spoken of (with the calyx) as "the floral envelopes." It is the stamens and pistils (or carpels) that are the true flowers; they do the mass of the real work; and an enormous number of flowers possess these organs alone, without any conspicuous petals or other coloured surfaces.

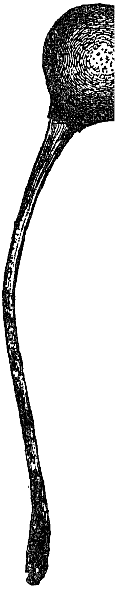


FIG. 16.—GR
MUCH MA
POLLEN-TU

However, if you take a pretty garden flower (say a scarlet geranium) as a typical example, and begin to examine it from the centre outward (which is the truest way), you
will find it consists of the follo
following order :—

In the very centre of all

consisting of one or more carpels, and containing the embryo seeds or ovules (see Fig. 15). Outside this part, and next in order, come the *stamens*, which are most often three or six in one great group of flowering plants (the lilies), and five, ten, or more in the other (the roses and buttercups). The stamens produce grains of pollen, which somehow or other, either by means of the wind, or of insects, or of movements on the part of the plant itself, are sooner or later applied to the sensitive surface or *stigma* of the pistil. As soon as a pollen-grain reaches the surface of the stigma, it is held there by a sticky secretion, and instantly begins to send out what is called a *pollen-tube* (Fig. 16). This pollen-tube makes its way down the long stem or *style* which joins the stigma to the ovary, and there comes in contact with the undeveloped *ovules*. The ovules would not swell and grow into seeds of themselves; but the moment the pollen-tube reaches them, they quicken into life, and begin to develop into fertile seeds. Unfertilised ovules wither away or come to nothing, but fertilisation by pollen makes them develop at once into new plant colonies.

Outside these *essential organs*, as botanists call them, however, come, in handsome garden flowers, two other sets of organs, more leaf-like in appearance, but often brightly or conspicuously coloured. The first of these sets of organs, going still from within outward, is called the *petals*, or, collectively, the *corolla*. Sometimes, as in the dog-rose or the buttercup, the corolla consists of five separate petals; sometimes, as in the harebell and the gentian, it has five points, or lobes, united at the base into a single piece (Fig. 17). Last of all, outside the corolla again comes another row or layer, called the *calyx*, which sometimes consists of five separate leaves or *sepals*, as in the dog-rose and the buttercup, but sometimes has five points, welded at the base into one piece, as in red campion and convolvulus. It is these last comparatively unessential but very conspicuous parts that most people think of when they say "a flower."

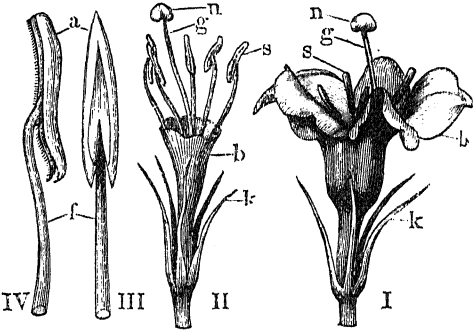


FIG. 17.—FLOWER OF A SHRUBBERY PLANT, WEIGELIA, WITH THE PETALS UNITED INTO SINGLE COROLLA. I. Entire flower. II. The same, with part of the corolla cut away. III. and IV. A stamen. *k*, calyx; *b*, corolla; *s*, stamen; *a*, anther of the stamen; *g* and *n*, parts of the pistil.

What is their use? Well, they are not essential, like the pistil and stamens, because many flowers, perhaps even most flowers, do without them altogether. But they are very useful for all that, as we may easily guess, because they are found in almost all the most advanced and developed flowers. The use of the *corolla,* with its brilliantly coloured petals, is to attract insects to the flowers and induce them to carry pollen from plant to plant. That is why they are painted red and blue and yellow; they are there as advertisements to tell the bee or butterfly, "Here you can get good honey." The use of the *calyx* is usually to cover up the flower in the bud, to keep it safe from cold, and to protect it from the attacks of insect enemies, who often try to break through and steal the half-developed pollen in the bags of the stamens before it is ripe and ready for fertilising. These are the chief uses of the calyx or outer cup of the flower; but, as we shall see hereafter, it serves many other useful purposes from time to time in various kinds of flowers. In the fuschia, for example, it is quite as brilliantly coloured as the petals of the corolla, and supplements them in the work of attracting insects. In the winter cherry or Cape gooseberry it forms a brilliant outer envelope or covering for the fruit, which the French call "*cerise en chemise,*" or "cherry in its nightdress." Other uses of both calyx and corolla will come out by and by, as we proceed to examine individual instances.

"But why," you may ask, "do the plants want to get pollen carried from plant to plant? Why can't each flower fertilise itself by letting its pollen fall upon its own pistil?" Well, the question is a natural one; and, indeed, many flowers do actually so fertilise themselves with their own pollen. But such flowers are almost always poor and degenerate kinds, the unsuccessful in the race, the outcasts and street arabs of plant civilisation. All the higher, nobler, and more dominant plants—the plants that have carved out for themselves great careers in the world, and that occupy the best posts in nature—have invented some mode or other of *cross-fertilisation*, as it is called, that is to say some plan by which the pollen of one plant or flower fertilises the pistil of another.

What does this mean? Well, regarding the plant as a colony, you will see at once that the stamens and pistil of the same blossom stand to one another somewhat in the relation of brothers and sisters, while those of different flowers on the same plant may be regarded at least in the light of first cousins. Now the very same thing that makes sex and marriage desirable, makes close intermarriage of blood relations undesirable. "Marrying in and in," as it is called, tends to produce weak and feeble offspring, while "an infusion of fresh blood" tends to make both plants and animals stronger and more vigorous. Hence, if any habit chanced to arise in plants which favoured or rendered easier such cross-fertilisation, it would result in stronger and more vigorous young, and would therefore be fixed by natural selection. The actual consequence is that in the world of plants, as we see it to-day, every great dominant or successful race has invented some means of cross-fertilisation, either by the agency of wind or of insects, while only the miserable riff-raff and outcasts of plant-life still adhere to the old and bad method of fertilisation by means of the pollen of their own flowers.

We are now in a position to understand the main principles which govern the marriage customs of plants; we will proceed in the next chapter to consider in detail how these principles work out in particular instances. But first we must sum up what we have learnt in this chapter.

Plants marry and are given in marriage. The very lowest plants, indeed, are sexless, but in the higher there are well-marked distinctions of male and female. An intermediate stage exists in certain thread-like pond-weeds, where marriage or intermixture takes place between two adjacent cells, neither of which is male or female. The higher plants, however, are really communities or colonies, of which the leaves are the workers, and the various parts of the flower the males and females. The central part of the flower, known as the pistil, is the female individual; it produces ovules, or young seeds, which, however, cannot grow and swell without the quickening aid of pollen. The next row in the flower, known as the stamens, contains the male individuals; they produce pollen, which lights on the sensitive surface of the pistil, sends out tubes of very active living matter, and quickens or impregnates the ovules in the pistil. Besides these necessary organs flowers have often two other sets of parts. The corolla, which is made up of petals, united or distinct, is usually brightly coloured, and acts as an advertisement or allurement to the insects; it occurs chiefly in insect-fertilised flowers, and generally implies the presence of honey. The calyx or outer cup, which is made up of sepals, distinct or united, acts mainly as a protective covering. Plants can fertilise themselves if necessary, but in all the highest and most successful plants some form or other of cross-fertilisation has become almost universal. Self-fertilisation goes down the hill; cross-fertilisation is the road to success and vigour.

CHAPTER VII.

VARIOUS MARRIAGE CUSTOMS.

THE simplest and earliest flowering plants had probably only three sets of organs—leaves, stamens, and pistils — workers, males, and females. Their flowers consisted at best of the necessary organs, enclosed, perhaps, in a few protective sheathing leaves, rather smaller than the rest, the forerunners of a calyx. How, then, did modern flowers come to get at last their brilliant corollas?

We must remember that anything which made flying insects visit plants would be of use to the flowers, as promoting cross-fertilisation. Now, as far as we can see at present, before flying insects were evolved in the animal world, there could have been no such things as bright-hued blossoms in the vegetable kingdom. But insects must very early have gone about eating pollen on plants, as they do to this day in many instances; and though in itself this would be a loss to the plant, yet plants have often found it well worth their while to pay blackmail to insects in return for some benefit incidentally conferred upon them. Again, as the insects flew from plant to plant, they would be sure to carry pollen on their heads and legs; and they would rub off this pollen on the sticky stigma of the next flower they visited, which would make them on the whole useful and profitable visitors. So the plants, finding the good cross-fertilisation did them, began in time to bribe the insects by producing honey in the neighbourhood of their pistils and stamens, and also to attract their eyes from afar by means of those alluring and brilliantly-coloured advertisements which we call petals.

I don't mean, of course, that the plants knew they were doing all this; they were unconscious agents. Whenever any variation in the right direction occurred by chance, natural selection immediately favoured it, so that in the end it comes almost to the same thing as if the plant deliberately intended to allure the insect; and for brevity's sake I shall often so word things.

How did the plant first come to develop such bright-hued petals? I think in this way. Most early types of flowers have a great many stamens apiece, and these stamens are so extremely numerous that one or two of them might readily be spared for any other purpose the plant found useful. Gradually, as botanists imagine, an outer row of these stamens got flattened out into a form like foliage leaves, only without any ribs or veins to speak of, and developed bright colours to attract the insects. Such a flattened and gaily-decked stamen, with no pollen-bearing bag, is what we call a petal. It is usually expanded, thin, and spongy, and it is admirably adapted for the display of bright colours.

We have still certain flowers among us which show us pretty clearly how this change took place. The common white water-lily is one of them. In the centre of the blossom, in that beautiful plant, we find a large pistil and numerous stamens of the ordinary sort, with round stalks or filaments, and yellow pollen-bags hanging out at their ends. Then, as we move outward, we find the filaments or stalks growing flatter and broader, and the pollen-bags gradually less and less perfect. Next we come to a few very flat and broad stamens, looking just like petals, but with two empty pollen-bags, or sometimes only one, stuck awkwardly on their edges. Last of all we arrive at true petals without a trace in any way of pollen-bags. I believe the water-lily preserves for us still some memory of the plan by which petals were first invented. Such relics of old conditions are common both in plants and animals; they help us greatly to reconstruct the history of the path by which the various kinds have reached their present perfection.

Even in our own day, in plants where stamens are numerous, they often tend to develop into petals, especially when growing in very rich soil, or under cultivation. This is what we call "doubling" a flower. In the double rose, for example, the extra petals are produced from the stamens of the interior, and if you examine them closely you will see that they often show every possible gradation and intermediate stage, from the perfect stamen to the perfect petal. The same thing readily happens with buttercups, poppies, and many other flowers. We may take it for granted, then, that petals are, in essence, a single outer row of stamens, flattened and coloured, and set apart by the plant to advertise its honey to insects, and so induce them to visit and fertilise it.

In the largest and most familiar group of flowering plants, to which almost all the best-known kinds belong, the original number of petals seems to have been *five;* and we will take this number as regular for the present, explaining separately those cases where it is exceeded or diminished. The common ancestor of all these plants, we may conclude, had all its parts in rows of five. Thus it had five, ten, or fifteen carpels in its pistil—that is to say, one, two, or three rows of five carpels each; it had five, ten, or fifteen stamens, it had five or ten petals, and it had a calyx, outside all, of five sepals. We will now proceed to examine in detail some of the many curious marriage customs which have arisen among the group of plants that started with this ground-plan.

One great family of plants which early divided itself from this great central stock is the family of the buttercups. Our common English bulbous buttercup is one of its best-known members. It is yellow in colour, a point which is common to most early and simple flowers, because the stamens are generally yellow, and when they developed into petals they naturally retained at first their original colouring. Only later and for various special reasons did certain higher flowers come by degrees to be white, pink, red, blue, purple, or variegated. There is some reason to believe, indeed, that the various other colours were developed one after the other in the order here named, and to the present day all the simplest families of flowers remain chiefly yellow, as do the simpler and earlier members of more advanced families.

The common bulbous buttercup is thus prevailingly yellow, because it is an early and simple type of flower. It consists of four distinct and successive layers, or whorls of organs. Outside all comes a calyx of five sepals, which cover the flower in the bud, but are hardly noticeable in the open blossom. They also serve to keep off ants and other creeping insects, for which purpose they are turned back on the stem, and are covered with small hairs. "But I thought the plant wanted to attract insects," you will say. Yes, the right kind of insects, the flying types, which go from one flower to another of the same sort, and so promote due fertilisation. Flying insects, attracted by colour and shape of petals, keep to one brand of honey at a time; they never mix their liquors. But ants are drawn on by the smell of honey only; they crawl up one stem after another indiscriminately, and steal the nectar which the plant intends for its regular winged visitors. Even if they do occasionally fertilise a flower, it will probably be with pollen of another kind, so that the result will be, not a perfect plant, but a miserable hybrid, ill adapted for any conditions. Hence plants usually possess advanced devices for keeping off ants and other climbing thieves from their precious honey. Hairs on the stalk and calyx are enough to secure this object in the meadow buttercup, which has a tall stem, and therefore is not so easily climbed; for the hairs, small as they look to us, prove to the ant a perfect forest of underwood. But in the early bulbous buttercup, which has a shorter stem, and the smell of whose honey is therefore more alluring to the groundling ant, this device is not alone sufficient; so the calyx on opening turns down its separate sepals close against the stem in such a way as to form a sort of lobster-pot, out of which the creeping insect can never extricate himself.

Inside the calyx-layer of five sepals comes next the corolla-layer of five petals. These petals, as we saw, are the attractive business advertisement of the flower; they contain at the base of each a tiny honey-gland or nectary, which is covered by a scale or small inner petal, so to speak, to protect it from the attacks of thievish insects. But when the bee or other proper fertilising agent arrives at the flower, he lights on the set of carpels in the very centre of the blossom, and proceeds to go straight for the little store of honey. As he does so, he turns gradually round all over the carpels, and dusts himself with pollen from the ripe stamens.

And now we must notice another curious device for ensuring cross-fertilisation in many flowers. In the bulbous buttercup the stamens and carpels do not come to maturity together; the stamens ripen first, and after them the carpels. How does this ensure cross-fertilisation? Why, if the bee comes to a flower in the first or male stage, in which the stamens are at their full, and discharging pollen, the sensitive surfaces or stigmas of the carpels will yet be immature, so that he cannot fertilise them with pollen from their own blossom. He can only collect there, without disbursing anything. But as soon as he comes to a flower in its second or female stage, with the carpels ripe, and their sensitive surfaces sticky, he will rub off some of the pollen he has thus collected, and so cross-fertilise the flower he is visiting.

Each buttercup thus goes through two stages. First, its stamens ripen from without inward, till all have shed their pollen and withered. Then the carpels ripen in the same order, till all have been fertilised by the appropriate insect. Each carpel here contains a single seed, which begins to swell as soon as the ovary is impregnated.

We may take it that some such flower as that of the bulbous buttercup represents the original ancestor of all the buttercup group, from which other kinds have varied in many directions. Omitting for the present all questions as to the fruit and seed, which we must examine at length in a later chapter, I will now proceed briefly to describe a few of these variations in the buttercup family.

The true buttercups themselves are distinguished from all other members of the group by having a tiny scale over the nectary or honey-gland at the base of the petal, or at least by having the nectary itself as a visible pit or small depression. Almost all of them are yellow, though in other respects they differ from one another, as in the shape of the leaves, or in the way in which the sepals are turned back to form a protection against insects. One of the yellow buttercups, too, commonly called the lesser celandine, has varied from the rest of the race in a peculiar fashion; for it has only three sepals, instead of five, according to the usual pattern; while, as if to make up for this loss in one part, it has eight petals instead of five in its corolla. I merely mention this fact to show how many small changes occur in different flowers, even within the limits of the same family. And though most of the true buttercups are yellow, a few are white, such as our own water-crowfoot, and the alpine buttercup called bachelors' buttons; while still fewer are red, like the turban ranunculus of our spring gardens.

But besides the true buttercups, we have also a vast group of buttercup-like plants, descendants of the same primitive five-petalled ancestor, and regarded as members of the buttercup order. In these we can trace some curious gradations. The little winter aconite of our gardens has this peculiarity: the petal and nectary have grown into a sort of tubular honey-cup, much more attractive to greedy insects than the simple scale-bearing petal of the buttercups. But as this involves loss of expanded colour-surface, the winter aconite has made up for the deficiency by colouring its calyx a brilliant yellow, so as to resemble a corolla. Several other buttercup-like plants have even lost their petals altogether, and make coloured sepals do duty in their place. The marsh-marigold, for instance, is one of these; what look like petals in it are really very brilliant yellow sepals. Moreover, as the marsh-marigold is such a large and handsome flower, it easily attracts insects in early spring; and this has enabled it to effect an economy in the matter of its carpels or female organs. In the buttercups, we saw, these were very numerous, and each contained only one seed; in the marsh-marigold, on the other hand, they are reduced to five or ten, but each contains a large number of seeds. This arrangement enables a few acts of fertilisation to suffice for the whole flower. You will therefore find as a rule that advanced types of flowers have very few carpels—sometimes only one—and that when they are more numerous they are often combined into a single ovary, with one sensitive surface, so that one fertilisation is enough for the whole of them.

Three familiar but highly-advanced members of the buttercup group will serve to show the immense changes effected in this respect by special insect fertilisation. They are the columbine, the larkspur, and the monkshood. In the simple buttercups, the honey, we saw, was easily accessible to many small insects; but in the winter aconite it was made more secure by being kept, as it were, in a sort of deep jar; and in these highest of the family it is still further hidden away, in special nooks and recesses, like vases or pitchers, so as to be only procurable by bees and butterflies. These higher insects, on the other hand, are the safest fertilisers, because they have legs and a proboscis exactly adapted to the work they are meant for; and they have also as a rule a taste for red, blue, and purple flowers, rather than for simple white or yellow ones. Hence the blossoms that specially lay themselves out for the higher insects are almost always blue or purple.

Columbine still retains the original five sepals and five petals of its buttercup ancestor. But the sepals here are blue or purple, and are displayed between the petals in a most curious manner, so as to help in the coloured advertisement of the honey. The petals, on the other hand, are turned into long spurred horns, each with a big drop of honey in its furthest recess, securely placed where only an insect with a very long proboscis has any chance of reaching it. Within these two rows come the numerous stamens; and within them again a set of five carpels, each many-seeded. The columbine is so secure of getting its seed set by bees or butterflies that it is able to dispense with the extra carpels.

Larkspur carries the same devices one step further. Here, there are five sepals, coloured blue, and prolonged into a spur at the base, which covers the nectaries. Why this outer covering? Well, in columbine, thievish insects like wasps often eat through the base of the spurred sepals and steal the honey, without benefiting the plant in any way, as they don't come near the stamens and carpels. Larkspur provides against that evil chance by covering its honey with two protective coats; for within the spur of the sepals lies a spurred nectary made up of the petals. The petals themselves are reduced to two, because the sepals are coloured, and do all the attractive duty; and besides, even these two petals are combined into one, as a further economy. But the arrangement of the flower is so admirable for ensuring fertilisation that the plant is able still further to dispense with unnecessary parts; so many larkspurs have only a single many-seeded carpel. Such reductions in the numbers of parts are always a sign of high development. Where the devices for effecting the work are poor, many servants are necessary; where labour-saving improvements have been largely introduced, a very few will do the same work, and do it better.

Monkshood, again, is another example of the same tendency. Here, the one-sidedness which we saw in the larkspur reaches a still more advanced development. The upper sepal is formed into a brilliant blue hood, and it covers two curiously shaped petals, which contain an abundant store of honey. This arrangement is so splendid for fertilisation that the plant is able largely to reduce its number of stamens; and though it has three carpels, these are combined at the base, thus showing the first step towards a united ovary.

I have treated the single family of the buttercups at some length, because I wished to show you what sort of variations on a single plan were common in nature. We see here a family, built all on one scheme, but altering its architecture and decoration in the most singular degree in its different members. The simplest kinds are circular, symmetrical, orderly, and yellow; the highest are irregular, somewhat strangely shaped, and blue or purple. This is the general line of evolution in flowers. They begin like the buttercup; they end like the monkshood.

Familiar instances of round or radial flowers, consisting of separate petals, are the dog-rose, the poppy, the mallow, and the herb-robert or wild geranium. Most of these have five sepals and five petals; but in the poppy the petals are usually reduced to four, and the sepals to two. Again, a good instance of flowers with separate petals which have become one-sided or irregular, instead of circularly symmetrical, is afforded us by the peaflowers, which include the pea, the bean, the sweet-pea, the laburnum, the broom, the gorse, the vetch, and the lupine. This familiar family, known to botanists as the papilionaceous or butterfly-like order (I trouble you with as few long names as I can, so you must forgive one or two occasionally), is one of the largest in the world, and includes a vast number of the most useful and also of the most ornamental species. The structure of the flower, which is very similar in them all, can be easily studied in the broom or the sweet-pea, plants procurable by everybody. There are still five petals, though two of them are united to form a lower portion of the flower, known as the keel; then two others at the side are called the wings; while a broad and often handsomely coloured advertisement-petal at the top of all is called the standard. The sepals are often combined into a single calyx-piece, though as a rule the calyx still retains five lobes or teeth, a reminiscence of the time when it consisted of five distinct and separate sepals. The stamens are welded together into a sort of long tube; and the pistil is reduced to a single carpel or pod, containing a few big seeds, very familiar to most of us in the case of the pea, the bean, and the scarlet-runner. This shape of flower has proved so successful in the struggle for life that papilionaceous plants are now common everywhere, while hundreds of different kinds are known in various countries.

Yet closely as the peaflowers resemble one another in general aspect, they have still among themselves a curious variety of marriage customs. I will mention two only. In gorse, a flower which everybody can easily examine, the wings have two little knobs at the sides for the bee to alight upon. As he does so, the corolla springs open elastically, and dusts him all over with the fertilising pollen. But once it has burst, it remains permanently open, the keel hanging down in a woe-begone way, so that no bee troubles himself again to visit it. This saves time for the bees, and enables them quicker to fertilise the remaining flowers; for when they see a gorse-blossom "sprung" as we call it, they recognise at once that it has already been fertilised, and they know they can get no food by going there. In the lupine, on the other hand, and in the common little English birdsfoot-trefoil, the keel is sharp at the point, and the pollen is shed into it before the flower fully opens. When a bee lights on the knobs at the side, he depresses the keel, and the pollen is pumped out against his breast in the most beautiful manner. I hope my readers will try some of these experiments in summer for themselves, and satisfy their own minds whether these things are so.

So far, we have dealt mainly with flowers in which the petals are all still distinct and separate. But in a great many plants, the petals have grown together, so as to form a single piece, a "tubular corolla," as we call it. This arrangement is very well seen in the harebell, the Canterbury bell, the heath, and the convolvulus. How did such an arrangement arise? Well, in many flowers even with distinct petals there is a slight tendency for adjacent parts to adhere at the base; and in certain blossoms this tendency to adhesion must have benefited the plant, because it would allow the proper fertilising insect to get in with ease, and to find his way at once to the stamens and stigma or sensitive surface. The consequence is that the majority of the higher plants have now corollas in a single piece; and most of these are also coloured red, blue, or purple. Still, even now many of them retain marks of the original five petals. For instance, the harebell has the edge of the corolla vandyked into five marked lobes; while in the primrose, only the base of the corolla forms a tube or united pipe, the outer part being composed of five deeply-cut lobes,

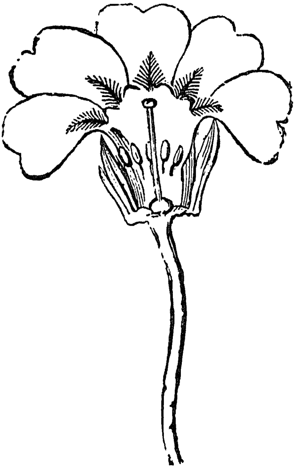


FIG. 18.—PIN-EYED PRIMROSE, CUT OPEN SO AS TO SHOW THE ARRANGEMENT OF THE STAMENS AND STIGMA.

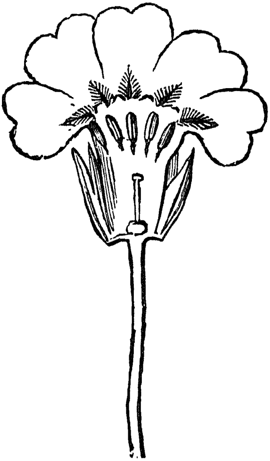


FIG. 19.—THRUM-EYED PRIMROSE, CUT OPEN SO AS TO SHOW STAMENS AND STIGMA.

reminiscences of the five original petals. Indeed, some relations of the primrose, such as the pimpernel and the woodland loose-strife, have the petals only slightly united at the base, and would hardly be noticed by a casual observer as possessing a tubular corolla.

There is one marriage custom of the primrose, however, so very interesting that we must not pass it by even in so brief a survey. Most children are aware that we have in our woods two kinds of primroses, which they know respectively as pin-eyed and thrum-eyed. In the pin-eyed form (Fig. 18), only the little round stigma is visible at the top of the pipe, while the stamens, here joined with the corolla-tube, hang out like little bags half-way down the neck of it. In the thrum-eyed form (Fig. 19), on the other hand, only the stamens are visible at the top of the tube, while the stigma, erected on a much shorter style, occupies just the same place in the tube that the stamens occupied in the sister blossom. Now, each primrose plant bears only one form of flower. Therefore, if a bee begins visiting a thrum-eyed form, he will collect pollen on his proboscis at the very base only; and as long as he goes on visiting thrum-eyed flowers, he can only collect, without getting rid of any grains on the deep-set stigmas. But when he flies away to a pin-eyed blossom, the part of his proboscis which collected pollen before will now be opposite the stigma, and will fertilise it; while at the same time he will be gathering fresh pollen below, to be rubbed off on the sensitive surface of a short-styled flower in due season.

Thus every pin-eyed blossom must always be fertilised by a thrum-eyed, and every thrum-eyed by a pin-eyed neighbour. This is one of the most ingenious arrangements known for cross-fertilisation.

Much as I should like to dwell further on these interesting cases, I must hurry on to complete our rapid survey of a great subject. Flowers like the harebell and the primrose are tubular but regular. Other flowers with a tubular corolla go yet a step further and are irregular also. This irregularity, like that of the monkshood, secures for them in the end greater certainty of fertilisation. Two well-known groups of this sort are the sages, on the one hand, and the fox-gloves, monkey-plants, and snap-dragons on the other. I shall mention only one instance of special devices for cross-fertilisation in these groups, that of the various sages, beautifully seen in the large blue salvias of our gardens. In this plant there are only two stamens, though most of the group to which it belongs have four, because the excellent arrangements for fertilisation make this single pair a great deal more effective than the thirty or forty required by the common buttercup. For the stamens are delicately poised on a sort of lever, so that the moment the bee enters the flower, they descend and embrace him, as if by magic. While the stamens alone are ripe, this continues to happen with each flower he visits; but when he goes away to an older blossom, he finds the stigma ripe, and bending over into the spot previously occupied by the stamens. You can try this experiment very easily for yourself by putting a straw or bent of grass down the tube of a garden salvia, when the stamens will at once bend down and embrace it in the way I have mentioned.

You must not suppose, however, that all flowers are fertilised by bees and butterflies. Many plants lay themselves out for quite different visitors. Take for example our common English figwort. This is a curious, lurid-looking, reddish-brown blossom, shaped somewhat like a helmet, and it is fertilised almost exclusively by wasps. Its shape and size exactly adapt it for a wasp's head ; and it blooms at the time of year when wasps are numerous. Now wasps, as you know, are carnivorous and omnivorous creatures ; so the figwort, to attract them, looks as meaty as it can, and has an odour not unlike that of decaying mutton. Certain tropical flowers again attract carrion-flies, and these have big blossoms that look like decomposing meat, and smell disgustingly. A South African flower of this sort, the Stapelia, is sometimes cultivated as a curiosity in greenhouses. I have already remarked on the white flowers which open at night, and attract the moths of twilight ; while others again lay themselves out to be fertilised by midges, beetles, and other insect riff-raff. Most of these have the honey displayed on wide open discs, where it can be sipped by insects with hardly any proboscis.

In our latitudes it is only insects that so act as fertilisers; but in the tropics the work of fertilisation is often performed by birds, such as humming-birds, sun-birds, and brush-tongued lories. Many of the most brilliant and beautiful among the bell-shaped tropical flowers have been specially developed to suit the tastes and habits of these comparatively large and powerful fertilisers. The tongues of all, but especially of the humming-birds, are admirably adapted for sucking honey from flowers, as they are long and tubular, sometimes forked at the tip, and often hairy so as to lick up both honey and insects. The length of the beak and tongue varies to a great extent in accordance with the depth of the tube in the flowers they fertilise. Bird and flower, in other words, have each been developed to suit one another. The same sort of correspondence may often be observed between insects and flowers developed side by side for mutual convenience.

One more point I should like to touch upon before I pass away from this part of the subject; and that is the lines or spots so often found on the petals of highly developed flowers. These for the most part act as honey-guides, to lead the bee or other fertilising insect direct to the nectar. A very good case of this may be seen in an Indian plant which is found in every English cottage garden—that is to say the so-called nasturtium. This beautiful blossom can only be fertilised by humble bees and humming-bird hawk-moths, no other insect in England at least having a proboscis long enough to reach to the bottom of the very deep spur which holds the honey. Now, humming-bird hawk-moths do not light on a flower, but hover lightly poised on their quivering wings in front of it. So all the arrangements of the flower are strictly set forth in accordance with the insect's habit. The calyx consists of five sepals with a very long spur, the end of which, as you can find out by biting it, is full of honey. Then come five petals, not, however, all alike, but divided into two distinct sets, an upper pair and a lower triplet. The upper pair are broad and deeply-lined with dark veins, which all converge about the mouth of the spur, and so show the inquiring insect exactly where to go in search of honey. The lower three, on the other hand, have no lines or marks, but possess a curious sort of fence running right across their face, intended to prevent other flying insects from alighting and rifling the flower without fertilising the ovary. This flower, too, has two successive stages; it opens male, with stamens only, which bend upward towards the insect; later, it becomes female, the stigma opens and becomes forked, and bends down so as to occupy the very same place previously occupied by the ripe stamens.

A great many well-known flowers have such lines as honey-guides. If I have succeeded so far in interesting you in the subject, you will find it a pleasant task to hunt them out for yourself in the violet, the scarlet geranium, the spotted orchid, and the tiger-lily.

So far I have dealt only with the marriage arrangements of those plants which are fertilised by insects or birds, and which belong to the great group of flowering plants descended from an early common ancestor with five petals. We must next deal briefly with the marriage customs of the insect-fertilised class among the other great group whose ancestor started with but three petals; and after that we must go on to the other mode of fertilisation by means of the wind or of self-impregnation.

This chapter has consisted so much of special cases that I do not think it stands in the same need of a summary as all its predecessors.

CHAPTER VIII.

MORE MARRIAGE CUSTOMS.

Almost all the flowering plants with which most people are familiar—all, indeed, save the pines and other conifers—belong to one or other of two great groups or alliances, each remotely descended from a common ancestor. The flowers we have hitherto been considering are entirely those which belong to one out of these two groups—the group which started with rows of five, having five sepals, five petals, five or ten stamens, and five or ten carpels. In several cases, certain of these rows have been simplified or reduced in number; but almost always we can see to the end some trace of the original fivefold arrangement. This fivefold arrangement is very conspicuous in all the stonecrops, and it may also be well noticed in wild geraniums, and less well in the strawberry, the dog-rose, and the cinquefoil.

In the present chapter, however, I propose to go on to sundry flowers of the other great group which has its parts in rows of three, and to show how they have been affected by insect visits. This will give us a clearer view of the whole subject, while it will also form a general introduction to systematic botany for those of my readers who may be induced by this book to carry their studies in this direction further.

Before proceeding, however, there is one little point I should like to note about the fivefold flowers, which we shall find much more common in the threefold, and among the wind-fertilised species. This is the separation of the sexes in different blossoms or even on separate plants. All the flowers we have so far considered have contained both male and female portions—have been made up of stamens and carpels united together in the self-same blossom. But many of them, as you will recollect, have not been actively both male and female at the same moment. The stamens ripened first, the sensitive surface of the carpels afterwards; and this, as we saw, tended to promote cross-fertilisation. But if in any species all the stamens in certain flowers were to be suppressed or undeveloped, while in other flowers the same thing happened to the carpels, self-fertilisation would become an absolute impossibility, and every blossom would necessarily be impregnated from the pollen of a neighbour. Natural selection has accordingly favoured such an arrangement in a considerable number of the higher plants. In such cases some of the flowers consist of stamens only, with no carpels; while others consist of carpels alone, with no stamens. But as all are descended from ancestors which had both organs combined in the same flower, remnants of the stamens often exist in the female flowers as naked filaments or barren threads, while remnants of the carpels equally exist in the male flowers as central knobs without seeds or ovules.

The beautiful begonias, so much cultivated in conservatories, give us an excellent example of such single-sex flowers. In these plants the males and females are extremely different. The male flower has four coloured and petal-like sepals, surrounding a number of central stamens. The female flower has five coloured and petal-like sepals, surrounding a group of daintily-twisted central stigmas, while at the base of the blossom is a large triangular ovary, containing the young seeds or ovules. Usually the flowers grow in little bunches of three, each bunch consisting of two males and one female.

In the pumpkins, cucumbers, and melons, separate male and female flowers also exist on the same plant. The females here may be easily recognised by having an ovary or small undeveloped fruit at the back of the blossom, which you can cut across so as to show the young seeds or ovules within it. As the proper insects for fertilising cucumbers and melons do not live in England, gardeners usually impregnate the female flowers by bringing pollen from the males to them with a camel's hair brush. This process is commonly known as "setting" the melons. Many other garden flowers have separate male and female blossoms, which the beginner can easily recognise for himself if he takes the trouble to look for them.

In the instances we have hitherto considered, the male and female blossoms live on the same plant. But the best cross-fertilisation of all is that which is secured where the fathers and mothers belong to totally distinct plants, a plan for facilitating which we have already seen in the common primrose. Well, now, if any species took to producing all male flowers on one plant, and all females on another, this great end would become absolutely certain, for every blossom would then always be fertilised by the pollen brought from a distinct plant. Many such instances have accordingly been produced in the world around us by natural selection. Only, the two kinds of plants must always grow in one another's neighbourhood. Hemp, for example, is a case of a plant where such an arrangement already exists; some plants are male only, while some are female. Mistletoe and hops are other well-known instances, which the reader should carefully examine for himself at the proper season.

All these are fivefold flowers, and I have brought them in here merely because one of the earliest and simplest threefold flowers we are going to consider has also this peculiarity of separate sexes. This is the common arrowhead, a plant that grows in watery ditches, and a capital example of the threefold type in its simpler development. Each flower, whether male or female, has a green calyx of three small sepals, and a white corolla of three much larger and somewhat papery petals (Fig. 20). But the male flowers have in their centre an indefinite number of clustering stamens; while the female flowers have an equally numerous set of tiny carpels. The blossoms grow in whorls on the same stem, the males above, the females beneath them. At first sight you would think this a bad arrangement, because you might fancy pollen from the males would certainly fall or blow out upon the females beneath them. But the plant prevents that catastrophe by a very simple dodge, which we shall have occasion to notice in many other parallel cases. The flowers open from below upward; thus the females mature first, and are fertilised by insects which bring to them pollen from other plants already rifled; later on the males follow suit, and their pollen

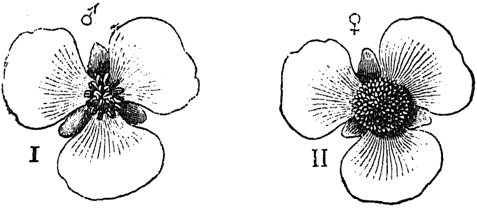


FIG. 20.—I. MALE, AND II, FEMALE FLOWERS OF ARROWHEAD.

is carried off by the visiting insect to the female flowers on the next plant it visits. Indeed, you may gather by this time how great a variety of devices natural selection has produced for securing this great desideratum of fresh blood, or cross-fertilisation, from a totally distinct plant colony.

A much commoner English wild-flower than the arrowhead shows us another form of early threefold blossom. I mean the water-plantain (Fig. 21), a pretty feathery weed, which grows by the side of most ponds and lakelets. In the water-plantain you have a flower of both sexes combined; it consists of three green sepals, forming a protective calyx; three delicate pinky - white petals, forming the corolla; six stamens—that is to say, two rows of three each; and a number of small one-seeded carpels, exactly as in the buttercup, which occupies, in fact, the corresponding place among the fivefold flowers.

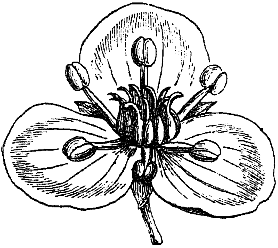


FIG. 21.—FLOWER OF WATER-PLANTAIN. The male and female parts are in the same blossom.

But it is not often in the threefold flowers that we get the calyx green and the corolla coloured, as in these simple and very early types. Most often in this great group of plants the calyx and corolla are both brightly coloured, and both alike

yed as effective advertisements. A good
f this sort is shown in the flowering-rush,
e relation of the arrowhead and the water-
in, but a more advanced and deve-
plant than either of them. Here the
and corolla, instead of forming two sepa-
ows, are telescoped into one, as it were,
re both rose-coloured. In such cases we
of the combined calyx and corolla as the
th (another long word, with which I'm
to trouble you). In such perianths, how-
even when all the pieces are of the same
nd are similarly coloured, you can see if
ok close that three of them are outside
lternate with the others; and these three
eally the calyx in disguise, got up as a
a. (An excellent example of this arrange-
is afforded by the common garden tulip.)
e its six rose-coloured perianth-pieces, the
ing-rush has nine stamens, arranged in
rows of three stamens each. Finally, in
entre, it has six carpels, equally arranged
vo rows of three. Here the threefold
ectural ground-plan of the flower is very
ent. You may say, in short, that the
al scheme of the two great groups is some-
like this: five sepals, five petals, five
ens, five carpels; or else, three sepals,
petals, three stamens, three carpels. But
y instance there may be two or more such
of any organ, especially of the stamens;
y instance certain parts may be reduced
mber or entirely suppressed; and in any
nce calyx and corolla may be coloured

is carried off by the visiting insect to the female flowers on the next plant it visits. Indeed, you may gather by this time how great a variety of devices natural selection has produced for securing this great desideratum of fresh blood, or cross-fertilisation, from a totally distinct plant colony.

A much commoner English wild-flower than the arrowhead shows us another form of early threefold blossom. I mean the water-plantain (Fig. 21), a pretty feathery weed, which grows by the side of most ponds and lakelets. In the water-plantain you have a flower of both sexes combined; it consists of three green sepals, forming a protective calyx; three delicate pinky-white petals, forming the corolla; six stamens—that is to say, two rows of three each; and a number of small one-seeded carpels, exactly as in the buttercup, which occupies, in fact, the corresponding place among the fivefold flowers.

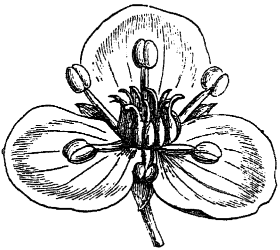


FIG. 21.—FLOWER OF WATER-PLANTAIN. The male and female parts are in the same blossom.

But it is not often in the threefold flowers that we get the calyx green and the corolla coloured, as in these simple and very early types. Most often in this great group of plants the calyx and corolla are both brightly coloured, and both alike employed as effective advertisements. A good case of this sort is shown in the flowering-rush, a close relation of the arrowhead and the water-plantain, but a more advanced and developed plant than either of them. Here the calyx and corolla, instead of forming two separate rows, are telescoped into one, as it were, and are both rose-coloured. In such cases we speak of the combined calyx and corolla as the *perianth* (another long word, with which I'm sorry to trouble you). In such perianths, however, even when all the pieces are of the same size and are similarly coloured, you can see if you look close that three of them are outside and alternate with the others; and these three are really the calyx in disguise, got up as a corolla. (An excellent example of this arrangement is afforded by the common garden tulip.) Inside its six rose-coloured perianth-pieces, the flowering-rush has nine stamens, arranged in three rows of three stamens each. Finally, in the centre, it has six carpels, equally arranged in two rows of three. Here the threefold architectural ground-plan of the flower is very apparent. You may say, in short, that the original scheme of the two great groups is something like this: five sepals, five petals, five stamens, five carpels; or else, three sepals, three petals, three stamens, three carpels. But in any instance there may be two or more such rows of any organ, especially of the stamens; in any instance certain parts may be reduced in number or entirely suppressed; and in any instance calyx and corolla may be coloured alike so as almost to resemble a single row or perianth.

There is one more point about the flowering-rush to which I would like to allude before going on to the other threefold flowers, and that is this. In arrowhead and water-plantain the carpels are very numerous, but each one-seeded. In flowering-rush, on the other hand, which has a larger and handsomer blossom, more attractive to insects, they are reduced to six; but these six have many seeds in each, so that a single act of fertilisation suffices for each of them. You may remember that among the fivefold flowers we found a precisely similar advance on the part of the marsh-marigold above the bulbous and meadow buttercups. This sort of advance is common in nature. Where a flower learns how to produce many seeds in a carpel, it can soon dispense with several of its carpels, because a few now do well what the many did badly. Furthermore, in higher plants, there is a tendency for these carpels to unite so as to form what we call a *compound ovary*, with a single style, when one act of fertilisation suffices for all of them. Such combinations or labour-saving arrangements obviously benefit both the insect and the plant, and have therefore been doubly favoured by natural selection.

We see this advance beautifully illustrated in the largest and loveliest family of the threefold flowers, the *lily* group, which contains a great number of the handsomest insect-fertilised blossoms, and is therefore deservedly an immense favourite in flower-gardens. All the lilies have a perianth (or combined calyx and corolla) of six almost similar brilliantly-coloured pieces (in which, however, you can still, as a rule, detect the sepals by their habit of overlapping the petals in the bud). Then they have a set of six stamens. Inside that, again, they have a single ovary, but if you cut it across with a penknife you will see at once it contains three chambers, each as a rule with several seeds; and these three chambers are a memory of the time when the ovary consisted of three separate carpels. From their midst arises a single long style; but you may observe all the same that it is made up of three original and distinct styles, because it divides at the top into three stigmas or sensitive surfaces. This is the general plan of the lily group; but in certain individual lilies the stigma is undivided, and in others again the parts are increased to four or even to eight, so as to obscure the primitive threefold arrangement.

Most of the large and handsome lilies cultivated in gardens have perianths of separate pieces, such as one knows so well in the tiger-lily, the Turk's-cap lily, and the beautiful Japanese *lilium auratum*. They have also abundant honey, stored in a deep groove of the spotted petals, and they are variegated and lined in such a way as to guide insects direct to their store of nectar. But the family has been so successful with the higher insects, and has produced such an extraordinary variety of very beautiful and brilliant flowers, that it is quite impossible to speak of them in detail. A few among them, like our own wild hyacinth, show a slight tendency on the part of the petals and sepals to unite into a bell-shaped tube; still, even here the pieces are really distinct and separate. But in the true garden hyacinth the pieces unite into a tubular perianth, like the tubular corolla of the common harebell, except that in the harebell the tube is formed by the union of the five petals, while in the hyacinth it is formed by the similar union of three petals and three sepals. A still higher form of the same union is shown us by the lily-of-the-valley, in which the six perianth-pieces join throughout to form a very beautiful heather-like cup or goblet. Other familiar members of this great lily group, which you ought to examine at leisure for yourself, in order to see how they are built up, are asparagus, Solomon's seal, fritillary, tulip, star-of-Bethlehem, squill, garlic, onion, tuberose, and asphodel. The cultivated lilies of one sort or another to be found in our gardens may be numbered by hundreds.

A family of threefold flowers almost as beautiful as the lily group, and seldom distinguished from them save by botanists, is that which bears the pretty Greek name of *amaryllids*. The amaryllids are lilies which differ from the rest of their kind, in the fact that the perianth, still composed of six pieces, has grown up and around the ovary so as to seem to spring from above it, not below it. Such flowers are said to have "inferior ovaries." In other respects the amaryllids closely resemble the lilies, having six coloured perianth-pieces, six stamens, and an ovary of three chambers, with one style in common. Several of the amaryllids are such familiar flowers that I shall venture to describe them as illustrative examples.

The snowdrop is an amaryllid which blossoms in early spring, and which shows in a simple form the chief features of the family. It has six perianth-pieces, but these are still distinctly recognisable as calyx and corolla. The three sepals are large and pure white, and they enclose the petals; the three petals are distinctly smaller, and tipped with green in a very pretty fashion. The summer snowflake, commonly cultivated in old-fashioned gardens, is very like the snowdrop, only here the difference between sepals and petals has disappeared; all six pieces form one apparent row, white, tipped with green, in a single perianth.

In the daffodils and narcissuses we get a second group of amaryllids more advanced and developed. Here the six perianth-pieces are almost alike, though they may still be distinguished as sepals and petals by a careful observer. But the perianth, which is tubular below, divides above into six lobes, beyond which it is prolonged again into what is called a crown, whose real nature can only be understood by comparison with such other flowers as the campions, where scales are inserted on the tip of the petals. This crown is comparatively little developed in the narcissus and the jonquil; but in the daffodil it has become by far the largest and most conspicuous part of the entire flower, so as completely to hide the bee who visits it. Of course this large crown assists fertilisation, and is a mark of advance in the daffodil and the petticoat narcissus. I hope these few remarks will induce you to examine many kinds of narcissus in detail, in order to see of what parts they are compounded.

This seems a convenient place to interpose another remark I have long wanted to make, namely, that the threefold flowers are also for the most part distinguished by having those narrow grass-like or sword-shaped leaves, with parallel ribs or veins, about which I told you when we were dealing with the question of varieties of foliage. The fivefold flowers, on the other hand, have usually net-veined leaves, either feather-ribbed or finger-ribbed. And at the risk of using two more horrid long words, I shall venture to add that botanists usually speak of the threefold group as *monocotyledons*, and of the fivefold group as *dicotyledons*. I did not invent those words, and I am sorry to have to use them here; but I will explain what they mean when I come to deal with seeds and seedlings. It is well at least to understand their use in case you come across them in your future reading.

Another family of threefold flowers, closely allied to the amaryllids, is that of the *irises,* many examples of which are familiar in our flower-gardens. It only differs from the amaryllids, in fact, in having the number of stamens still further reduced to three, which is always a sign of advance, because it shows that the plants are so sure of fertilisation as to be able to dispense with all unnecessary pollen. The ovary is also inferior, which you will learn in time to recognise as a constant sign of high development, because it means that the base of the corolla and calyx have coalesced with the carpels, and so ensured greater certainty of fertilisation. Some simple members of the iris group, like the crocuses, have mere tubular flowers, with a very long funnel-like base to the corolla, and with the ovary buried in the ground for greater safety. They are early spring blossoms, which need much protection against cold; therefore they thus bury their ovaries, and sheathe their flower-buds in a papery covering, composed of a thin and leathery leaf. Whenever a sunny day comes in winter the bees venture out; and on all such days, even though it freeze in the shade, the crocuses are open in the sunshine to welcome them.

But other irises are more complicated, like the gladiolus, and still more the garden irises, in which the difference between the calyx and corolla is carried to its furthest point in this family. The sepals in true irises are large and brilliantly coloured; they hang over gracefully; the petals are smaller and erect; the stigmas are so expanded as to look like petals; and they arch over the stamens in a most peculiar manner. If you watch a bee visiting a garden iris, you will see for yourself the use of this most peculiar arrangement; the bee lights on the bending sepal, and inserts his head between the stigma and the stamen in a way which renders fertilisation simply inevitable. But the most curious part of it all is that the flower, from the point of view of the bee, resembles three distinct and separate blossoms; he alights one after another on each bending sepal, and proceeds to search for honey as if in a new flower.

Highest of all the threefold flowers, and most wonderful in their marriage customs, are the great group of orchids, some of which grow wild in our English meadows, while others fix themselves by short anchoring roots on the branches of trees in the tropical forests. Many of these last produce the handsomest and most extraordinary flowers in the world, and they are

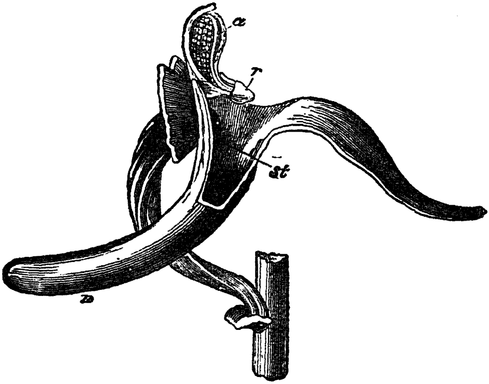


FIG. 22.—SINGLE FLOWER OF ORCHID, WITH THE PERIANTH CUT AWAY. The honey is in the spur, *n;* the pollen-masses are marked *a;* their gummy base is at *r;* the stigma at *st.*

much cultivated accordingly in hothouses and conservatories. It would be quite impossible for me to give you any account of the infinite devices invented by these plants to secure insect-fertilisation; and even the structure of the flower is so extremely complex that I can hardly undertake to describe it to you intelligibly; but I will give you such a brief statement of its chief peculiarities as will enable you to see how highly it has been specialised in adaptation to insect visits.

The ovary in orchids is inferior, and curiously twisted. It supports six perianth-pieces, three of which are sepals, often long and very handsome; while two are petals, often arching like a hood over the centre of the flower. The third petal, called the lip, is quite different in shape and appearance from the other two, and usually hangs down in a very conspicuous manner. There are no visible stamens, to be recognised as such; but the pollen is contained in a pair of tiny bags or sacks, close to the stigma. It is united into two sticky club-shaped lumps, usually called the pollen-masses (Fig. 22). In other words, the orchids have got rid of all their stamens except one, and even that one has united with the stigma.

I will only describe the mode of fertilisation of one of these plants, the common English spotted orchis; but it will suffice to show you the extreme ingenuity with which members of the family often arrange their matrimonial alliances. The spotted orchis has a long tube or spur at the base of its sepals (Fig. 22, *n*), and this spur contains abundant honey. The pollen-masses are neatly lodged in two little sacks or pockets near the stigma, and are so placed that their lower ends come against the bee's head as he sucks the honey. These lower ends (*r*) are gummy or viscid, and if you press a straw or the point of a pencil against them, the pollen-masses gum themselves to it naturally, and come readily out of their sacks as you withdraw the pencil (Fig. 23). In the same way, when the bee presses them with his head, the pollen-masses stick to it, and he carries them away with him as he leaves the flower. Just at first, the pollen-masses stand erect on his forehead; but as he flies through the air, they dry and contract, so that they come to incline forward and outward. By the time he reaches another plant they have assumed such a position that they are brought into contact with the stigma as he sucks the honey. But the stigma is gummy too, and makes the pollen adhere to it, and in this

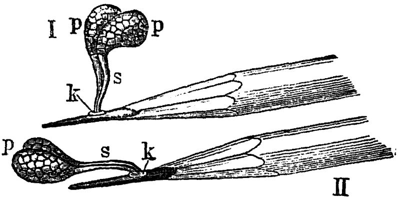


FIG. 23.—POLLEN-MASSES OF AN ORCHID, WITHDRAWN ON A PENCIL. In I, they have just been removed. In II, they have dried and moved forward.

way cross-fertilisation is rendered almost a dead certainty. The result of these various clever dodges is that the orchids have become one of the dominant plant-families of the world, and in the tropics usurp many of the best and most favoured positions (Fig. 24).

Darwin has written a most romantic book on the numerous devices by which orchids alone attract insects to fertilise them. I will say no more of this family, therefore—the highest and strangest among the threefold flowers—save merely to advise those who wish to know more of this curious subject to look it up in his charming volume. Instead of pursuing the matter at issue further, I will give one final example in an opposite direction.

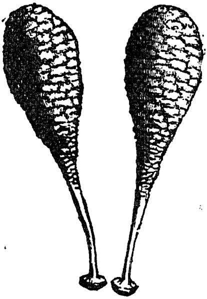


FIG. 24.—THE TWO POLLEN-MASSES, VERY MUCH ENLARGED.

An opposite direction, I say, because all the threefold flowers we have hitherto been considering are examples of a strict upward movement of evolution. Each group we have examined has been higher and more complex than the group before it. But I will now show you an instance, if not of degeneracy, at least of extreme simplification, which yet produces in the end the best possible results. This instance is that of the common English arum, known to children as cuckoo-pint or "lords and ladies" (Fig. 25).

The structure of the cuckoo-pint is very peculiar. What looks like the flower is not really any part of the flower at all, but a large outer leaf or *spathe* surrounding a group of very tiny blossoms. You can understand this leaf better if you look at a narcissus stalk, where

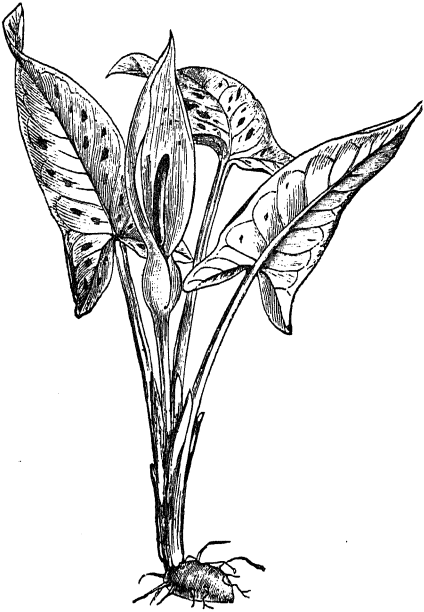


FIG. 25.—THE COMMON ARUM, OR CUCKOO-PINT, SHOWING THE SPATHE WHICH SURROUNDS THE FLOWERS, AND THE SPIKE STICKING UP IN THE MIDDLE.

a very similar leaf is seen to enclose a whole bunch of buds and opening flowers. Only, in the narcissus the spathe is thin, whitish, and papery, while in the cuckoo-pint it is expanded, green, and purple. Though not a corolla, it serves the same purpose as a corolla generally performs: it attracts insects to the compound flower-head.

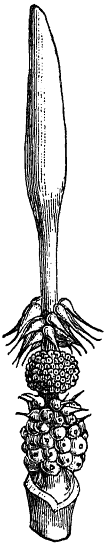


FIG. 26.—SPIKE OF THE CUCKOO-PINT, WITH THE SPATHE CUT AWAY. Below are the female flowers; above them, the male; and, on top of all, the abortive flowers, reduced to hairs, which form the lobster-pot.

Inside the spathe we find a curious club-shaped mass, coloured bright purple, and standing straight up in the middle of the head. This is the stem or axis on which the separate little flowers are arranged. Cut open the spathe, and you will find these flowers below in the centre (Fig. 26). At first sight what you see will look like a lot of confused little knobs; but when you gaze closer you will see they separate themselves into three groups, which are the true flowers. Lowest of all on the stem come the female blossoms, without calyx or corolla, each consisting of a single ovary. Above these in a group come the male flowers, equally devoid of calyx or corolla, and each consisting of a single stamen. Above these again come abortive or misshapen flowers, each of which has been reduced to a single downward-pointing hair. I will explain first what is the use of these flowers in the cuckoo-pint as it stands to-day, and then I will go back to consider by what steps the plant came to develop them.

The upper flowers, which look like hairs, and point all downwards, occupy a place in the compound flower-head just opposite the conspicuous narrowed part of the spathe which surrounds and encloses them. At this narrow point they form a sort of lobster-pot. It is easy enough for an insect to creep down past them, but very difficult or impossible for him to creep up in the opposite direction, as all the hairs point sharply downward. Now, when the spathe unfolds, large numbers of a very small midge of a particular species are attracted into it by the purple club which rises like a barber's pole in the middle. If you cut a cuckoo-pint open during its flowering period you will always find a whole mob of these wee flies, crawling about in it vaguely, and covered from head to foot with pollen. They have come from another cuckoo-pint which they previously visited, and they have brought the pollen with them on their wings and bodies. But when they first reach the head, they find no pollen there; the female flowers at the bottom ripen first, and the midges, creeping over the sensitive surface of these, fertilise them with pollen from the last plant they entered. Finding nothing to eat, if they could they would crawl out again; but they can't, for the lobster-pot hairs prevent them. So they stop on perforce, having unwittingly fertilised the female flowers, but received themselves as yet no reward for their trouble. By and by, however, after all the female flowers have been duly fertilised, the males above begin to ripen. When the stamens reach maturity, they shower down a whole flood of golden pollen on the expectant midges. Then the midges positively roll and revel in the flood, eating all they can, but at the same time covering themselves all over with a dust of pollen-grains. As soon as the pollen is all shed, the downward-pointing hairs wither away; the lobster-pot ceases to act; and the midges are at liberty to fly away to another plant, where they similarly begin to fertilise the female flowers. Observe that, if the stamens were the first to ripen here, the pollen would fall on the stigmas of the same plant, but that, by making the stigmas be the first to mature, the cuckoo-pint secures for itself the desired end of cross-fertilisation.

In this case it is an interesting fact that all the stages which led to the existing arrangement of the flowers still remain visible in other plants for us. These very reduced little blossoms of the cuckoo-pint, consisting each of a single carpel or a single stamen, are yet the descendants of perfect blossoms which had once a regular calyx and corolla. Near relations of the cuckoo-pint live in Europe and Africa to this day, which recapitulate for us, as it were, the various stages in its slow evolution. Some, the oldest in type, have a calyx and corolla, green and inconspicuous, with six stamens inside them, enclosing a two or three-celled ovary. These are still essentially lilies in structure. But they have the flowers clustered, as in cuckoo-pint, on a thick club-stem, and they have an open spathe, which more or less protects them. Our English sweet-sedge is still at this stage of evolution. The marsh-calla of Northern Europe and Canada, on the other hand, has a handsome white spathe to attract insects, while its separate flowers, still both male and female together, have each six stamens and a single ovary. But they have lost their perianth. The common white arum or "calla lily" of cottage gardens has a bright yellow spike in its midst, and if you look at it closely you will see that this spike consists entirely of a great cluster of stamens, thickly massed together. The top of the spike is entirely composed of such golden stamens, but lower down you will find ovaries embedded here and there among them, each ovary as a rule surrounded by five or six stamens. Lastly, in the cuckoo-pint the lower flowers have lost their complement of stamens altogether, while the upper ones have similarly lost their ovaries; moreover, a few of the topmost have been converted into the curious lobster-pot hairs which assist, as I have shown you, in the work of fertilisation. We have here a singular and instructive example of what may be described as *retrograde development.*

And now we must go on to those modes of fertilisation which are effected by agencies other than insects.

CHAPTER IX.

THE WIND AS CARRIER.

All flowers do not depend for fertilisation upon insects. In many plants it is the wind that serves the purpose of common carrier of pollen from blossom to blossom.

Clearly, flowers which lay themselves out to be fertilised by the wind will not be likely to produce the same devices as those which lay themselves out to be fertilised by insects. Natural selection here will favour different qualities. Bright-coloured petals and stores of honey will not serve to allure the unconscious breeze; such delicate adjustments of part to part as we saw in the case of bee and blossom will no longer be serviceable. What will most be needed now is quantities of pollen; and that pollen must hang out in such a way from the cup as to be easily dislodged by passing breezes. Hence wind-fertilised flowers differ from insect-fertilised in the following particulars. They have never brilliant corollas or calyxes. The stamens are usually very numerous; they hang out freely on long stalks or filaments; and they quiver in the wind with the slightest movement. On the other hand, the stigmas are feathery and protrude far from the flower, so as to catch every passing grain of pollen. More frequently than among the insect-fertilised section, the sexes are separated on different plants or isolated in distinct masses on neighbouring branches. But numerous devices occur to prevent self-fertilisation.

You must not suppose, again, that the wind-fertilised plants form a group by themselves, distinct in origin from the insect-fertilised, as the three-petalled group is distinct from the five-petalled. On the contrary, wind-fertilised kinds are found abundantly in both great groups; it is a matter of habit; so much so that sometimes a type has taken first to insect-fertilisation and then to wind-fertilisation, with comparatively slight differences in its external appearance. Closely related plants often differ immensely in their marriage customs; each has varied in the way that best suited itself, according as insects or breezes happened to serve it most readily. In my own opinion all wind-fertilised plants are the descendants of insect-fertilised ancestors; but I do not know whether in this belief my ideas would be accepted by most modern botanists.

As a first example of wind-fertilised flowers, I will take the common dog's mercury, a well-known English wayside flower, frequent in copses and hedgerows, and one of the very earliest to blossom in spring. In this species the males and females grow on separate plants. They have each a calyx of three sepals (two more being suppressed, for they belong by origin to the fivefold division). The males have ten or twelve stamens apiece, which hang out freely with long stalks to the breeze. The females have a two-chambered ovary, with rudiments or relics of some two or three stamens by its side, showing that they are descended from earlier combined male-and-female ancestors. The relics, however, consist of mere empty stalks or filaments, without any pollen-sacks. Of course there are no petals. Male and female plants grow in little groups not far from one another; and the pollen, which is dry and dusty, is carried by the wind from the hanging stamens of the males to the large and salient stigma of the female flowers.

A still better example of a wind-fertilised blossom is afforded us by the common English salad-burnet, a pretty little weed, very frequent on close-cropped chalk downs (Fig. 27). Here the individual flowers are extremely small, and they are crowded into a sort of mop-like head at the top of the stem. They have lost their petals, which are now of no use to them; but they retain a calyx of four sepals, to represent the original five still found among their relations. For salad-burnet, in spite of its inconspicuousness, belongs to the family of the roses, and we can still trace in this order a regular gradation from handsome flowers like the dog-rose, through

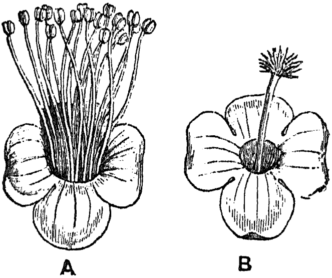


FIG. 27.—A, MALE, AND B, FEMALE FLOWER OF SALAD-BURNET, VERY MUCH MAGNIFIED. The flowers grow together in little tassel-like heads.

smaller and smaller blossoms like the strawberry and the potentilla, to green petalless types like lady's-mantle and parsley-piert, or, last of all, to wind-fertilised blossoms like those of the salad-burnet. In the male flowers the very numerous stamens hang out on long thread-like stalks from the wee green cup, so that the wind may readily catch and carry the pollen: in the female blossoms the stigma is divided into plume-like brushes, which readily entrap any passing pollen-grain. Moreover, though both kinds of flower grow on the same head, the females are mostly at the top of the bunch, and the males below them. This makes it difficult for the pollen from the same head to fertilise the females, as it would easily do if the males were at the top. Nor is that all; the female flowers open first on each head, and hang out their pretty feathery stigmas to the breeze that bends the stem; as soon as they have been fertilised from a neighbour plant, the males in turn begin to open, and shed their pollen for the use of other flowers. In salad-burnet, however, the division of the sexes into separate flowers has not become a quite fixed habit; for, though most of the blossoms are either maleor female only, as shown in the figure, we often find a cup here and there which contains both stamens and pistil together.

I have already told you that in many plants the calyx helps the corolla as an advertisement for insects; and sometimes, as in the marsh-marigold and the various anemones, where there are no petals at all, it becomes so brilliant as to be mistaken for petals by all but botanists. One way in which such a substitution often happens is shown us by the great burnet, which is a close relation of the salad-burnet. This plant, after having acquired the habit of wind-fertilisation, has taken again at last to insect marriage. Having lost its petals, however, it can't easily redevelop them; so it has had instead to make its calyx purple. The plant as a whole closely resembles the salad-burnet; but the flowers are rather different; the stamens no longer hang out of the calyx; the calyx cup is more tubular; and the stigma is shortened to a little sticky knob, instead of being divided into feathery fringes. These differences are all very characteristic of the contrast between wind and insect-fertilisation.

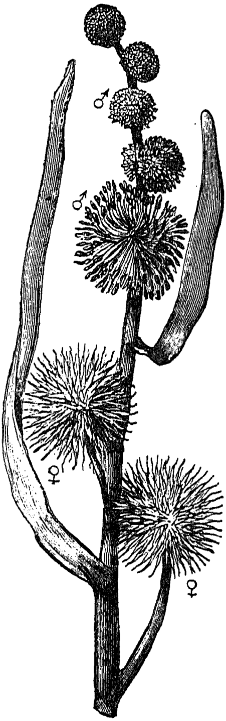


FIG. 28.—FLOWERS OF BUR-REED. The two lower heads consist of female blossoms, the five upper ones of males. Only one head of the males is mature; the others are still in the bud.

The common nettle supplies us with an excellent example of another form of wind-fertilisation, carried to a still higher pitch of development. Here the sexes grow on different plants, and the flowers are tiny, green, and inconspicuous. The males consist of a calyx of four sepals, each sepal with a stamen curiously caught under it during the immature stage. But as soon as they ripen they burst out elastically, and shoot their pollen into the air around them. In this case, and in many like it, the plant itself helps the wind, as it were, to disseminate its pollen.

The common English bur-reed is a waterside plant of great beauty which shows us another interesting instance of wind-fertilisation in an advanced condition (Fig. 28). Here the separate flowers are very much reduced—as simple, in fact, as those of the cuckoo-pint. The males consist of nothing but stamens, gathered in close globular heads, with a few small scales interspersed among them, which seem to represent the last relics of a calyx. The females are made up of single ovaries, each surrounded by three or six scales, still forming a simple rudimentary calyx. They, too, are clustered in round heads or masses on antler-like branches. The plant belongs to the threefold group, and represents a very degenerate descendant of a primitive ancestor something like the arrowhead already described in the last chapter. But the arrangement of the heads on the stem is very interesting. The balls at the top are entirely composed of male flowers; those at the bottom are exclusively female. The female flowers ripen first, and receive pollen by aid of the wind from some other plant that grows close by them. As soon as they have begun to set their seeds the stigmas wither, and then the male flowers open in a bright yellow mass, the stalks of their stamens lengthening out as they do so, and allowing the wind to carry the pollen freely. Here, although the males are above, the peculiar arrangement by which the females ripen first makes it practically impossible for the flowers to be fertilised by pollen from their immediate neighbours.

The devices for wind-fertilisation, however, are on the whole less interesting than those for insect-fertilisation, so I shall devote little more space to describing them. I will only add that two great classes of plants are habitually wind-fertilised: one includes the majority of forest trees; the other includes the grasses, sedges, and many other common meadow plants.

The wind-fertilised forest trees belong for the most part to the fivefold group, and have their flowers, as a rule, clustered together into hanging and pendulous bunches, which we call *catkins*. It is obvious why trees should have adopted this mode of fertilisation, because they grow high, and it is easy for the wind to move freely through them. For this reason, most catkin-bearing trees flower in early spring, when winds are high, and when the trees are leafless; because then the foliage doesn't interfere with the proper carriage of the pollen. In summer the leaves would get in the way; the pollen would fall on them; and the stigmas would be hidden. Most catkins are long, and easily

In hazel (Fig. 29) the male and female flowers grow on the same tree, but are most different to look at. You would hardly take

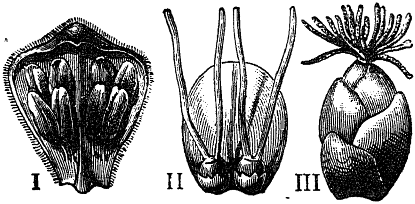


FIG. 29.—FLOWERS OF THE HAZEL. I, a single male flower, removed from a catkin. II, a pair of female flowers. III, a female catkin.

them for corresponding parts of the same species. The male flowers are grouped in long sausage-shaped catkins, each blossom covered with a tiny brown scale, and all arranged like tiles on a roof against the cold of winter. There are about eight stamens to each blossom, with little trace of a calyx or corolla. But the females are grouped in funny little buds, like crimson tufts, well protected by scales; they consist of the future hazel-nut, with a red style and feathery stigma projecting above to catch the pollen. Here the flowers are very little like the regular types with which we are familiar; yet intermediate cases help to bridge over the gap for us.

For example, in the alder we get a type which seems to stand half-way between the nettle and the hazel (so far, I mean, as the arrangement of the flower is concerned, for otherwise the nettle belongs to a quite different family). The male and female catkins of the alder grow on the same tree; the males consist of numerous clustered flowers, three together under a scale, which nevertheless, when we take the trouble to pick them out and examine them with a pocket-lens, are seen to resemble very closely the male flowers of the nettle. Each consists of a four-lobed calyx, with four stamens opposite the sepals. The female flowers have degenerated still further, and consist of little more than a scale and an ovary.

Other well-known wind-fertilised, catkin-bearing trees are the oak, the beech, the birch, and the hornbeam. But the willows, though they bear catkins, and were once no doubt wind-fertilised, have now returned once more to insect-fertilisation, as you can easily convince yourself if you stand under a willow tree in early spring, when you will hear all the branches alive with the buzzing of bees, both wild and domestic. Nevertheless, the willow, having once lost its petals, has been unable to develop them again. Still, its catkins are far handsomer and more conspicuous than those of its wind-fertilised cousins, owing to the pretty white scales of the female bunches, and the numerous bright yellow stamens of the males. It is this that causes them to be used for "palm" in churches on Palm Sunday. The male and female catkins grow on different trees, so as to ensure cross-fertilisation, and the difference between the two forms is greater perhaps than in almost any other plant, the males consisting of two showy stamens behind a winged scale, and the females of a peculiar woolly-looking ovary.

Even more important is the great wind-fertilised group of the grasses, to which belong by far the most useful food-plants of man, such as wheat, rice, barley, Indian corn, and millet.

Grasses are for the most part plants of the open wind-swept plains, and they seem naturally to take therefore to wind-fertilisation. Their flowers are generally small, clustered into light spikes or waving panicles, and hung out freely to the breeze on slender and very movable stems, so as to yield their pollen to every breath of air that passes. Moreover, the plants as a whole are slender and waving, so that they bend before the breeze in the mass, as one often sees in a meadow or cornfield. Thus the grasses are almost the pure type of wind-fertilised plants; certainly they have carried further than any other race the devices which render wind-fertilisation more certain.

On this account they are so complicated and varied that I will not attempt to describe them in detail. I will only say that grasses are descendants of the threefold flowers, and in all probability degenerate lilies. Their individual blossoms usually consist of a very degraded calyx (*d* and *e*) of two sepals (one of which represents a pair that have coalesced, Fig. 30). Inside these sepals come two very minute white petals (*c* and *c*); the third has disappeared, owing to pressure one-sidedly. The petals can scarcely be seen without the aid of a pocket-lens. Next come three stamens (*b*), the only part of the flower which still preserves the original threefold arrangement. Last of all we get the ovary (*a*), of one carpel, one seeded, but with two feathery stigmas, which were once

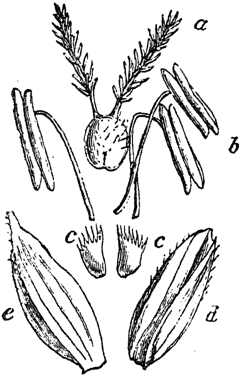


FIG. 30.—A FLOWER OF WHEAT, WITH ITS PARTS DIVIDED: *a*, the carpel and stigmas; *b*, the stamens; *c*, the petals, very minute; *d* and *e*, the calyx.

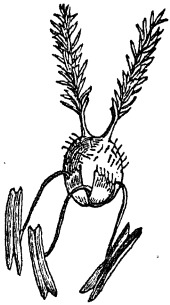


FIG. 31.—FLOWER OF WHEAT, WITH THE CALYX OF TWO CHAFFY SCALES REMOVED. This shows the arrangement of petals, stamens, and ovary.

three. In a very few large grasses, such as the bamboos, the threefold arrangement is much more conspicuous. As a rule the stamens of grasses hang out freely to the wind, and the stigmas are feathery and most graceful in outline (Fig. 31). The flowers are usually collected in spikes like that of wheat, or in loose clusters like oats; they frequently hang over in pendulous bunches. Their success may be gathered from the fact that almost all the great plains in the world, such as the American prairies, the Pampas, and the Steppes, are covered with grasses; while even in hilly countries the valleys and downs are also largely clad with smaller and more delicate species. No plants assume so great a variety of divergent forms; the total number of kinds of grasses can hardly be estimated; in Britain alone we have more than a hundred native species.

I will give no further examples of wind-fertilised flowers. If you look for yourself you can find dozens on all sides in the fields around you. They may almost always be recognised by these two marked features of the hanging stamens and the feathery stigma.

Before I pass on to another subject, however, I ought to mention that by no means all flowers are regularly cross-fertilised. There are some degraded types in which self-fertilisation has become habitual. In these plants, which are usually poor and feeble weeds like groundsel and shepherd's purse, the stamens bend round so as to impregnate the pistil in the same blossom. In other less degraded cases the flower is occasionally cross-fertilised by insect visits; but if no insect turns up in time, the stamens, even in handsome and attractive blossoms, often bend round and impregnate the pistil. A very good example of this is seen in our smaller English mallow, which has large mauve flowers to attract insects; but should none come to visit it, the stamens and stigmas at last intertwine, and self-fertilisation takes place, for want of better. Still, as a general rule, it holds good that self-fertilisation belongs to scrubby and degraded plants; it is only adopted as a last resort when all other means fail by the superior species.

CHAPTER X.

HOW FLOWERS CLUB TOGETHER.

In the preceding chapters I have dealt for the most part with individual flowers; I have spoken of them separately, and of the work they do in getting the seeds set. Incidentally, however, it has been necessary at times to touch slightly upon the way they often mass themselves into heads or clusters for various purposes; and we must now begin to consider more seriously the origin and nature of these co-operative societies.

Very large flowers, like the water-lily, the tulip, the magnolia, the daffodil, are usually solitary; they suffice by themselves to attract in sufficient numbers the fertilising insects.

But smaller flowers often find it pays them better to group themselves into big spikes or masses, as one sees, for example, in the foxglove and the lilac. Such an arrangement makes the mass more conspicuous, and it also induces the insect, when he comes, to fertilise at a single visit a large number of distinct blossoms. It is a mutual convenience; for the bee or butterfly, it saves valuable time; for the plant, it ensures more prompt and certain fertilisation. In many families, therefore, we can trace a regular gradation between large and almost solitary flowers, through smaller and somewhat clustered flowers, to very small and comparatively crowded flowers. Thus the largest lilies are usually solitary or grow at best three or four together, like the *lilium auratum;* in the tuberose and asphodel, where the individual blossoms are smaller, they are gathered together in big upright spikes; in the hyacinth, the clustering is closer still; while in wild garlic, grape-hyacinth, and star-of-Bethlehem, the arrangement assumes the form of a flat-topped bunch or a globular cluster. Of course, small flowers are sometimes solitary, and large ones sometimes clustered; but as a general rule the tendency is for the big blossoms to trust to their own individual attractions, and for the little ones to feel that union is strength, and to organise accordingly.

Botanists have invented many technical names for various groupings of flowers in particular fashions, with most of which I will not trouble you. It will be sufficient to recall mentally the very different way in which the flowers are arranged in the lily-of-the-valley, the foxglove, the Solomon's seal, the heath, the scabious, the cowslip, the sweet-william, the forget-me-not, in order to see what variety natural selection has produced in all these matters. Two instances must serve to illustrate their mode of action. The foxglove grows in hedgerows and thickets, and turns its one-sided spike towards the sun and the open; its flowers open regularly from below upward, and are fertilised by bees, who enter the blossoms, and whose body is beautifully adapted to come in contact, first with the stamens, and later with the stigma. (Examine this familiar flower for yourself in the proper season.) In the forget-me-not, on the other hand, the unopened flowers are coiled up like a scorpion's tail; but as each one opens, the stem below it lengthens and unrolls, so that at each moment the two or three flowers just ready for fertilisation are displayed conspicuously at the top of the apparent cluster.

There are two forms of cluster, however, so specially important that I cannot pass them over here without some words of explanation. These are the umbel and the head, both of frequent occurrence. An umbel is a cluster in which the flowers, standing on separate stalks, reach at last the same level, so as to form a flat-topped mass, like the surface of a table. An immense family of plants has very small flowers arranged in such an order; they are known as umbellates, and they include hemlock, fool's parsley, cow-parsnip, carrot, chervil, celery, angelica, and samphire. In other families the same form of cluster is seen in

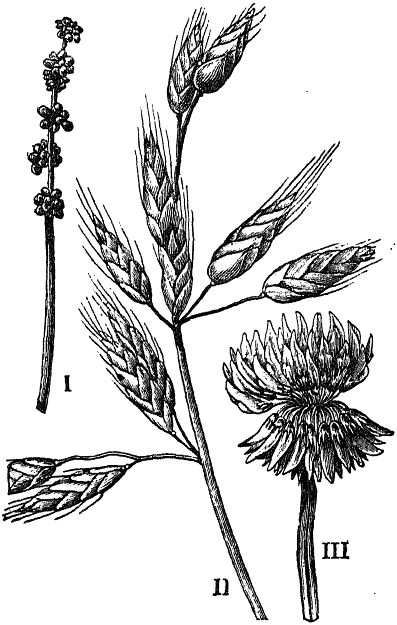


FIG. 32.—CLUSTERS OF FLOWERS. I, spike of mercury, green, wind-fertilised. II, panicle of a grass (brome), green, wind-fertilised. III, head of Dutch clover, the upper flowers unvisited as yet by insects; the lower fertilised, and turning down to make room for their neighbours.

ivy and garlic. A head, again, is a cluster in which the individual flowers are set close on very short stalks or none at all in a round ball or a circle. Clover and scabious are excellent examples of this sort of co-operation.

If you examine a head of common white Dutch clover (Fig. 32, iii.), you will see for yourself that it is not, as you might suppose, a single flower, but a thick mass of small white pea-like blossoms, each on a stalk of its own, and each provided with calyx, corolla, stamens, and pistil. They are fertilised by bees; and as soon as the bee has impregnated each blossom, it turns down and closes over, so as to warn the future visitor that he has nothing to expect there. The flowers open from below and without, upward and inward; and there is always a broad line between the rifled and fertilised flowers, which hang down as if retired from business, and the fresh and upstanding virgin blossoms, which court the bees with their bright corollas. Sometimes you will find a head of clover in which all the flowers save one have already been fertilised; and this one, a solitary old maid as it were, stands up in the centre still waiting for the bees to come and fertilise it.

By far the most interesting form of head, however, is that which occurs in the daisy, the sunflower, the dandelion, and their allies, where the club or co-operative society of united blossoms so closely simulates a single flower as to be universally mistaken for one by all but botanical observers. To the world at large a daisy or a dahlia is simply a flower; in reality it is nothing of the sort, but a city or community of distinct flowers, differing widely from one another in structure and function, but all banded together in due subordination for the purpose of effecting a common object. There is a vast and very varied family of such united flowers, known as the *composites;* it stands at the head of the fivefold group of flowering plants, as the orchids stand at the head of the threefold; and it is so widely spread, it includes so large a proportion of the best-known plants, and it fills so great a space in the vegetable world generally, that I cannot possibly pass it over even in so brief and hasty a history as this of the development of plants on the surface of our planet.

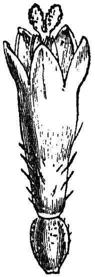


FIG. 33.—SINGLE FLORET FROM THE CENTRE OF A DAISY.

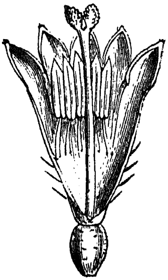


FIG. 34.—SINGLE FLORET FROM THE CENTRE OF A DAISY, WITH THE COROLLA OPENED, MUCH ENLARGED.

If you pick a daisy you will think at first sight it is a single flower. But if you look closer into it you will see it is really a great group of flowers—a compound flower-head, composed of many dozen distinct blossoms or florets, as we call them (Fig. 33). These, however, are not all alike. The florets in the centre, which you took no doubt at first sight for the stamens and pistils, are small yellow tubular blossoms, each with a combined corolla of five lobes, little or no visible calyx, five stamens united in a ring round the style, and a pistil consisting of an inferior ovary, with a style divided above into a twofold stigma (Fig. 34). Here we have clear evidence that the plant belongs by origin to the five-petalled group; it rather resembles the harebell, in the plan of its flower, on a much smaller scale; but it has almost lost all trace of a separate calyx, it has its five petals united into a tubular corolla, it has still its original five stamens, but its carpels are now reduced to one, with a single seed, though traces of an earlier intermediate stage, when the carpels were two, remains even yet in the divided stigma.

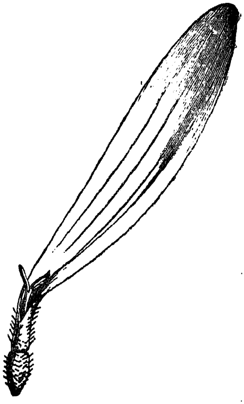


FIG. 35.—SINGLE FLORET FROM THE RAY OF A DAISY, PINK AND WHITE, WITH AN OVARY, BUT NO STAMENS.

So much for the inner flowers or florets in the daisy. The outer ones, which you took at first no doubt for petals, are very different indeed from these central blossoms. They have an extremely curious long, strap-shaped corolla (Fig. 35), open down the side, but tubular at its base, as if it had been split through the greater part of its length by a sharp penknife. Instead of being yellow, too, these outer florets are white, slightly tinged with pink, and they form the largest and most attractive part of the whole flower-head. Furthermore, they are female only; they have a style and ovary, but no stamens. Clearly, we have here a flower-head with numerous unlike flowers, which at once suggests the idea of a division of labour between the component members. How this division works we shall see in the sequel.

The best way to see it is to follow up in detail the evolution of the daisy and the other composites from an earlier ancestor. We saw already how the petals combined in the harebell and many other flowers so as to form a tubular corolla. A purple flower of some such type seems to have been the starting-point for the development of the great composite family. The individual blossoms in the common ancestral form seem to have been small and numerous; and, as often happens with small flowers, they found that by grouping themselves together in a flat head they succeeded much better in attracting the attention of the fertilising insects. Many other tubular flowers that are not composites have independently hit upon the same device; such are the scabious, the devil's-bit, the sheep's-bit, and the rampion. But these flowers differ from the true composites in two or three particulars. In the first place, each tiny flower has a distinct green calyx, of five sepals; while the composites have none, or at least a degraded one. In the second place, the stamens are free, while in the composites they have united in a ring or cylinder. In the third place, the ovary is divided into from two to five cells, a reminiscence of the original five distinct carpels; whereas in the composites the ovary is always single and one-seeded. In all these respects, therefore, the composites are later and more advanced types than, say, the sheep's-bit, which is a flower-head composed of very tiny harebells.

The composites, then, started with florets which had little or no calyx, the sepals having been converted into tiny feathery hairs, used to float the fruit (as in thistledown and dandelion), about which we shall have more to say in a future chapter. They had a corolla of five purple petals, combined into a single tube. Inside this again came five united stamens, and in the midst of all an inferior ovary with a divided stigma. Hundreds of different kinds of composites now existing on the earth retain to this day, in the midst of the greatest external diversity, these essential features, or the greater part of them.

You may take the thistle as a good example of the composite flowers in an early and relatively simple stage of development (Fig. 36). Here the whole flower-head resembles a single large purple blossom. To increase the resemblance, it has below it what seems at first sight to be a big green calyx of very numerous sepals. What is this deceptive object? Well, it is called an *involucre*, and it really acts to the compound flower-head very much as the calyx acts to the single blossom. The florets having got rid of their separate calyxes, the flower-head provides itself with a cup of leaves (technically called *bracts*), which protect the unopened head in its early stages, and serve to keep off ants or other creeping insects exactly as a calyx does for the single flower. Inside this involucre, again, all the florets of the thistle are equal and similar. Each has a tiny calyx, hardly recognisable as such, made up of feathery hairs which cap the inferior ovary. Within this fallacious calyx, once more, the floret has a purple corolla

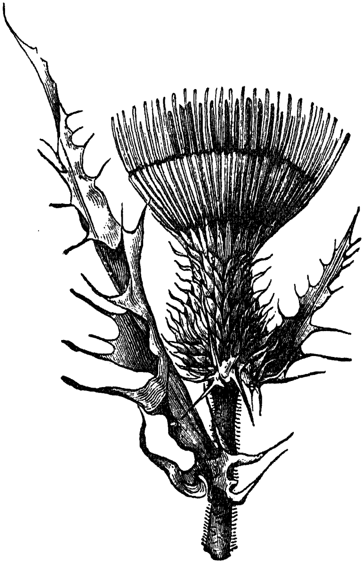


FIG. 36.—FLOWER-HEAD OF A THISTLE, CONSISTING OF VERY NUMEROUS PURPLE FLORETS, ALL EQUAL AND SIMILAR.

of five petals, united into a tube. Then come the five united stamens, and the pistil with its divided stigma. This is the simplest and central form of composite, from which the others are descended with various modifications.

To this central type belong a large number of well-known plants, both useful and ornamental, though more particularly deleterious. Among them may be mentioned the various thistles, such as the common thistle, the milk thistle, the Scotch thistle, and so forth, most of which have their involucres, and often their leaves as well, extremely prickly, so as to ward off the attacks of goats and cattle. The burdock, the artichoke, the saw-wort, and the globe-thistle also belong to the same central division. Among these earlier composites, however, there is one group, that of the centauries, which leads us gradually on to the next division. Our commonest centaury in Britain (known to boys as hardheads) has all the florets equal and similar, and looks in the flower very much like a thistle. But one of its forms, and most of the cultivated garden centauries, have the outer florets much larger and more broadly open than the central ones, so that they form an external petal-like row, which adds greatly to the attractiveness of the entire flower-head. Of this type, the common blue cornflower is a familiar example. Clearly the plant has here developed the outer florets more than the inner ones in order to make them act as extra special attractions to the insect fertilisers.

The more familiar type of composites so much cultivated in gardens carries these tactics a step further. We saw reason to believe in a previous chapter that petals were originally stamens, flattened and brightly coloured, and told off for the special attractive function. Just in the same way the ray-florets of the daisy, the sunflower, the single dahlia, and the aster are florets which have been flattened and partially or wholly sterilised in order to act as allurements to insects. The ray-floret acts for the compound flower-head as the petal acts for the individual blossom.

In many other families of plants besides the composites we get foreshadowings, so to speak, of this mode of procedure. The outer flowers of a cluster, be it head or umbel, are often rendered larger so as to increase the effective attractiveness of the whole; and sometimes they are sacrificed to the inner ones by being made neuter or sterile, that is to say, being deprived of stamens and pistil. Thus in cow-parsnip, which is a member of the same family as the carrot and the hemlock, the outer flowers of each umbel are much larger than the central ones, while in the wild guelder-rose the central flowers alone are fertile, the outer ones being converted into mere expanded white corollas with no essential floral organs. But it is the composites that have carried this process of division of labour furthest, by making the ray-florets into mere petal-like straps, which do no work themselves, but simply serve to attract the fertilising insects to the compound flower-head.

An immense number of these composites with flattened ray-florets grow in our fields or are cultivated in our gardens. In the simpler among them, such as the sunflower, the corn-marigold, the ragwort, and the golden-rod, both ray-florets and central florets are simply yellow. But in others, such as the daisy, the ox-eye daisy, the aster, and the camomile, the ray-florets differ in colour from those of the centre; the latter remain yellow, while the former become white, or are tinged with pink, or even flaunt forth in scarlet, crimson, blue, or purple. Of this class one may mention as familiar instances the dahlia, the zinnia, the Michaelmas daisies, the cinerarias, and the pretty coreopsis so common in our gardens. Gardeners, however, are not content to let us admire these flowers as nature made them. They generally "double" them—that is to say, by carefully selecting certain natural varieties, they produce a form in which all the florets have at last become neutral and strap-shaped. This is well seen in the garden chrysanthemum, where, however, if you open the very centre of the doubled flower-head, you will generally find in its midst a few remaining fertile tubular blossoms. The same process is also well seen in the various stages between the single and the double dahlia. Such "double" composites can set little or no seed, and are therefore from the point of view of the plant mere abortions. Nor are they beautiful to an eye accustomed to the ground-plan of floral architecture. Remember, of course, that what we call "a double flower" in a rose, a buttercup, or any other simple blossom is one in which the stamens have been converted into supernumerary and useless petals; while in a composite it is a flower-head in which the central florets have been converted into barren ray-florets. In either case, however, the result is the same—the flowers are rendered abortive and sterile.

Nature's way is quite different. Here is how she manages the fertilisation of one of these ray-bearing composites—say for example the sunflower, where the individual florets are quite big enough to enable one to follow the process with the naked eye. The large yellow rays act as advertisements; the bee, attracted by them, settles on the outer edge and fertilises the flowers from without inward. To meet this habit of his, the florets of the sunflower pass through four regular stages. They open from without inward. In the centre are unopened buds. Next come open flowers, in which the stamens are shedding their pollen, while the stigmas are still hidden within the tube. Third in order, we get florets in which the stamens have withered, while the stigmas have now ripened and opened. Last of all, we get, next to the rays, a set of overblown florets, engaged in maturing their fertilised fruits. The bee thus comes first to the florets in the female stage, which he fertilises with pollen from the last plant he visited; he then goes on to florets in the male stage, where he collects more pollen for the next plant to which he chooses to devote his attention. The florets of the sunflower are interesting also for the fact that, unlike most composites, they still retain obvious traces of a true calyx.

The composites which produce purple or blue ray-florets to attract insects are in some ways the highest of their class. Still, there is another group of composites which has proceeded a little further in one direction; and that is the group which includes the dandelions. In these heads all the florets alike have become strap-shaped or ray-like; but they differ from the double composites of the gardeners in this, that each floret still retains its stamens and pistil. The composites of the dandelion group are chiefly weeds like the hawkbit and the sow-thistle. A few are cultivated as vegetables, such as lettuce, salsify, chicory, and endive; fewer still are prized for their flowers for ornamental purposes, such as the orange hawk-weed. The prevailing colour in this class is yellow, and the devices for insect-fertilisation are not nearly so high as in the ray-bearing group. I regard them as to a great extent a retrograde tribe of the composite family.

In this chapter I have dealt chiefly with the co-operative clubbing together of insect-fertilised flowers, for purposes of mutual convenience; but you must not forget that similar clubs exist also among the wind-fertilised blossoms in quite equal profusion. Such are the catkins of forest trees, the panicles of grasses, the spikes of sedges, and the heads of the black-cap rush and many other water-plants. Some of these, such as the bur-reed, we have already considered.

Lastly, I ought to add that where the flowers themselves are inconspicuous, attention is often called to them by a bright-coloured leaf or group of leaves in their immediate neighbourhood. We saw an instance of this in the great white spathe or folding leaf which encloses the male and female flowers of the "calla lily." In the greenhouse poinsettia the individual flowers are tiny and unnoticeable; but they are rich in honey, and round them has been developed a great bunch of brilliant scarlet leaves which renders them among the most decorative objects in nature. A lavender that grows in Southern Europe has dusky brown flowers; but the bunch is crowned by a number of mauve or lilac leaves, hung out like flags to attract the insects. A scarlet salvia much grown in windows similarly supplements its rather handsome flowers by much handsomer calyxes and bracts which make it a perfect blaze of splendid colour. It doesn't matter to the plant how it produces its effect; all it cares for is that by hook or by crook it should attract its insects and get itself fertilised.

CHAPTER XI.

WHAT PLANTS DO FOR THEIR YOUNG.

After the flower is fertilised it has to set its seed. And after the seed is set the plant has to sow and disperse it.

Now, the fruit and seed form the most difficult part of technical botany, and I will not apologise for treating them here a little cavalierly. I will tell you no more about them than it is actually necessary you should know, leaving you to pursue the subject if you will in more formal treatises.

The pistil, after it has been fertilised and arrived at maturity, is called the fruit. In flowers like the buttercup, where there are many carpels, the fruit consists of distinct parts, each one-seeded little nuts in the meadow buttercup, but many-seeded pods in the marsh-marigold and the larkspur. Where the carpels have combined into a single ovary, we get a many-chambered fruit, as in the poppy, which consists, when cut across, of ten seed-bearing chambers. Most fruits are dry capsules or pods, either single, as in the pea, the bean, the vetch, and the laburnum; or double, as in the wallflower and shepherd's-purse; or many-chambered, as in the lily, the wild hyacinth, the poppy, the campion. As a rule the fruit consists of as many carpels or as many chambers as the unfertilised ovary.

Fruits are often dispersed entire, and this is especially true when they contain only one or two seeds. In such instances they sometimes fall on the ground direct, as is the case with most nuts; or else they have wings or parachutes which enable the wind to seize them, and carry them to a distance, where they can alight on unexhausted soil, far away from the roots of the mother plant. Such fruits are common among forest trees. The maples, for example, have a double fruit, often called a *key*, which the wind whirls away as soon as the seeds are ready for dispersion (Figs. 37, 38, 39, 40, 41). In the lime, the common stalk of the flowers is winged by a thin leaf; and when the little nuts are ripe the wind detaches them and carries them away by means of this joint parachute. In the birch, elm, and ash the fruit is

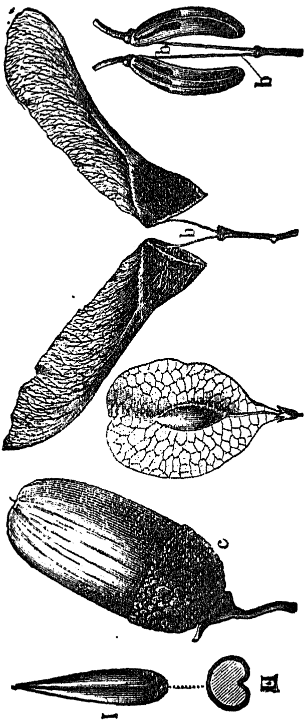


FIG. 37. FIG. 38. FIG. 39. FIG. 40. FIG. 41.

FORMS OF FRUITS. Fig. 37, grain of oat, cut across the middle. Fig. 38, nut or acorn of oak. Fig. 39, winged nut of elm: all these are one-seeded. Fig. 40, winged fruit of the sycamore, a kind of maple: each half contains a seed. Fig. 41, double fruit of cow-parsnip: each half contains a seed.

a one-seeded nut, with its edge produced into a leathery or papery wing, which serves to float it.

But more often the fruit at maturity opens and scatters its seeds, as we see in the pea, the wild hyacinth, and the iris. Sometimes the seeds so released merely drop upon the ground, but most often some device exists for scattering them to a distance, so as to obtain the advantage of unexhausted soil for the young seedling. Thus most capsules open at the top, so that the seeds can only drop out when the wind is high enough to carry them to some distance. In the poppy-head the capsule opens by pores at the side, and, if you shake one as it grows, you will find it takes a considerable shaking to dislodge the seeds from the walls of their chamber. Thus only in high winds are the poppy seeds dispersed. In the mouse-ear chickweed the capsule is directed slightly upward at the end for a similar purpose. Sometimes, again, the valves of the fruit open elastically and shoot out the seeds; this device is familiarly known in the garden balsam, and it occurs also in the little English wallcress. The sandbox-tree of the West Indies has a large round woody capsule, which bursts with a report like a pistol, and scatters its seeds with such violence as to inflict a severe wound upon anybody who happens to be struck by them.

Where seeds are numerous, they are oftenest dispersed in some such manner, by the capsule opening naturally and scattering its contents; but where they are few in number, it more frequently happens that the fruit does not open, as in the oak or the elm; and when there is only one seed, the fruit and seed become almost

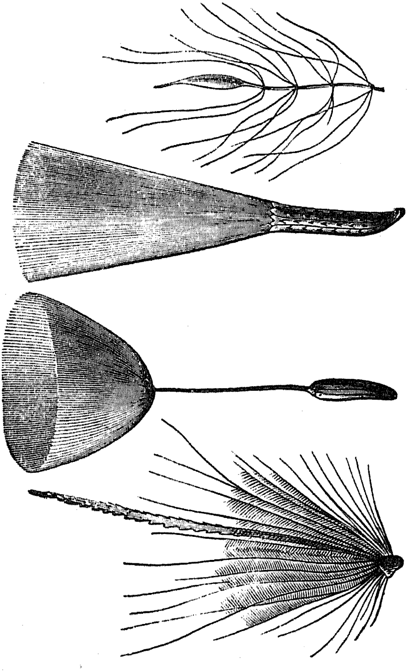


FIG. 42. FIG. 43. FIG. 44. FIG. 45.

FLOATING FRUITS. Fig. 42, of a Mexican grass. Fig. 43, of dandelion. Fig. 44, of hawkweed. Fig. 45, of bulrush.

indistinguishable, and are popularly regarded as a seed only. For example, in the pea, we distinguish at once between the pod, which is a fruit containing many seeds, and the pea which is one such seed among the many; but in wheat or oats the fruit is small and one-seeded, and its covering is so closely united with the seed as to be practically inseparable. Fruits like these do not open, and are dispersed whole. The fruits of most composites are crowned by the feather-like hairs which represent the calyx, and float on the breeze as thistledown or dandelion-clocks (Figs. 42, 43, 44, 45). John-go-to-bed-at-noon, an English composite of the dandelion type, has a very remarkable and highly-developed parachute of this description. In the anemones and clematis the fruit consists of several distinct one-seeded carpels, each furnished with a long feathery awn for the purpose of floating; our common English clematis or traveller's joy, when in the fruiting condition, is known on this account as "old man's beard." Floating fruits like these, or those of many sedges and grasses, will often be carried by the wind for miles together. A well-known example of this type is the sedge commonly though wrongly described as cotton-grass.

In other instances it is the seed, not the fruit, that is winged or feathered. The pod of the willow opens at maturity, and allows a large number of cottony seeds to escape upon the breeze. The same thing happens in the beautiful rose-bay and the other willow-herbs. Cotton is composed of the similar floating hairs attached to the seeds of a sub-tropical mallow-like tree.

You will have observed, however, that not one of the fruits which I have hitherto mentioned is a fruit at all in the common or popular acceptation of the word. They are only at best what most people call pods or capsules. A true fruit, as most people think of it, is coloured, juicy, pulpy, sweet, and edible. How did such fruits come into existence, and what is the use of them?

Well, just as certain plants desire to attract insects to fertilise their flowers, so do other plants desire to attract birds and beasts to disseminate their fruits for them. If any fruit happened to possess a coloured and juicy outer coat, or to show any tendency towards the production of such a coat, it would sooner or later be eaten by animals. If the animal digested the actual seed, however, so much the worse for the plant, and we shall see by and by that most plants take great care to prevent their true seeds being eaten and assimilated by animals. But if the seed was very small and tough, or had a stony covering, it would either be passed through the animal's body undigested, or else thrown away by him when he had finished eating the pulpy exterior. So, many plants have acquired fruits of this description—edible fruits, intended for the attraction of birds and animals. As a rule the animals disperse the seeds in the well-manured soil near their own nests or lairs, so that the young plants produced from such fruits start in life under exceptional advantages.

Fruits that seek to attract animals use much `e same baits to allure them in the way of colour and sweet taste as do the flowers that seek to attract insects. But just as almost any part of the flower may be brightly coloured, so almost any part of the fruit may be sweet and pulpy. Thus we get an astonishing and rather embarrassing variety of special devices in this matter.

A few instances must suffice us. In the raspberry and blackberry the fruit consists of separate carpels, in each of which the outer coat becomes soft and sweet, while the actual seed is hard and nut-like. In the one case the fruit is red, in the other black, but very conspicuous among the green leaves in autumn. These berries are eaten by birds, and their seeds are dispersed in copse or hedgerow. But in the strawberry, which is a near relation of both, with a very similar flower, the actual carpels remain to the end quite small and seed-like; they are the tiny hard objects scattered about in pits like miniature nuts over the surface of the ripe berry. Here it is the common receptacle of the fruit that swells out and reddens, the part answering to the central piece which comes out whole in the middle of the raspberry; so that what we eat in the one fruit is the very same part as what we throw away in the other. In the plum, the cherry, and the peach, on the other hand, there is but one carpel, and its outer covering grows soft, sweet, and brightly coloured; while the actual seed, though soft, is contained in a hard and stony jacket, an inner layer of the fruit coat. Here the true seed is what we call the kernel, but it is amply protected by its bone-like coverlet. In the apple and pear the ovary is inferior; the fruit is thus crowned by the remains of the calyx; if you cut it across you will find it consists of a fleshy part, which is the swollen stem, enclosing the true fruit or core, with a number of seeds which we call the pips. All these fruits belong to the family of the roses; they serve to show the immense variety of plan and structure which occurs even in closely related species. Other succulent fruits of the same family are the rose-hip, the haw, the medlar, and the nectarine.

Among familiar woodland fruits dispersed by birds I may mention the elderberry, the dogwood, the honeysuckle, the whortleberry, the holly, the cuckoo-pint, the barberry, and the spindle-tree. The white berries of the mistletoe, which is a parasitic plant, are eaten by the missel-thrush, a bird who has a special affection for this particular food. But they are very sticky, and the seeds therefore adhere to the bird's beak and feet. To get rid of them, he rubs them off on the fork of a poplar branch, or in the bark of an apple-tree, which are the exact places where the mistletoe most desires to place itself. Many such close correspondences between bird and fruit exist in nature.

Our northern berries are chiefly designed to be eaten by small birds like robins and hawfinches. But in southern climates larger fruits exist, adapted to the tastes of larger animals such as parrots, toucans, hornbills, fruit-bats, and monkeys. Our own small kinds can generally be eaten whole, like the currant and the strawberry; but these large southern fruits have often a bitter or unpleasant or very thick rind, which the birds or monkeys, for whose use they are intended, know how to strip off them. Cases in point are the orange, the lemon, the shaddock, the banana, the pine-apple, the mango, the custard-apple, and the breadfruit. The melon, cucumber, pumpkin, gourd, vegetable marrow, and water-melon are other southern forms cultivated in the north for the sake of their fruits. In the pomegranate the fruit itself is a dry capsule, but the seeds are each enclosed in a separate juicy coat. The grape is a fruit too well known to require detailed description.

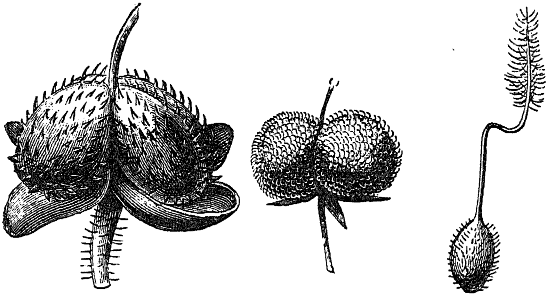


FIG. 46. FIG. 47. FIG. 48.

ADHESIVE FRUITS. Fig. 46, of houndstongue. Fig. 47, of cleavers. Fig. 48, of herb-bennet.

As flowers sometimes club together, so also do fruits. In the mulberry the apparent berry is really made up of the distinct carpels of several separate flowers, which grow together as they ripen; while the fig is a hollow stalk, in which numerous tiny fruits, commonly called seeds, are closely embedded.

In all these cases animals act as willing agents in the dispersal of fruits or seeds. But sometimes the plant compels them to carry its seeds against their will. Thus the fruits of the houndstongue (Fig. 46) consist of four small nuts, covered with hook-like prickles, which cling to the coats of sheep or cattle. The beasts rub these annoying burdens off against bushes or hedges, and so disseminate the seeds in suitable places for germination. The double fruit of cleavers (Fig. 47) is also supplied with similar prickles, while that of herb-bennet (Fig. 48) has a long curved awn which makes it catch at once on any passing animal.

There are a large number of fruits, however, with richly stored seeds, which desire rather to escape the notice of animals, some of whom, like squirrels and dormice, try to make their living out of them. These we call nuts. Their tactics are the exact opposite of those pursued by the edible fruits. For the edible fruits strive to attract animals to disperse them; the nuts, on the contrary, having the actual seed richly stored with oils and starches, desire to protect it from being eaten and destroyed. Hence they are generally green when on the tree, so as to escape notice, and brown when lying on the ground beneath it. Cases of these protectively-arranged fruits, with hard shells and often with nauseous external coverings (some of which are not regarded as nuts in the strict botanical sense), are the walnut, the hazel-nut, the coco-nut, the chestnut, the acorn, the lime-nut, the almond, and the hickory-nut. In the Brazil nut the seeds (which are what we commonly call the nuts) are enclosed in a solid shell like that of a coco-nut, and are themselves also hard and nut-like. In the chestnut the fruit is a prickly capsule, inside which lie the seeds, which we know as chestnuts.

But why have some plants so many seeds and some so few? Well, the simpler and earlier types produce a very large number of ill-provided seeds, which they turn loose upon the world to shift for themselves almost from the outset. Many of them perish, but a few survive. On the other hand, the more advanced plants, as a rule, produce only a small number of seeds, but each of these is well provided with starches and oils for the growth of the young plant; and as most such survive, any tendency in the direction of laying by food-stuffs would of course be favoured by natural selection. Just so among animals, a codfish produces nearly a million eggs, of which only two or three on an average survive to maturity; while a bird produces half a dozen large and well-stored eggs, and a cow or a horse rarely brings forth more than one calf or foal at a birth. Decrease in the number of seeds is a fair rough test of relative progress.

In nuts, you can see at once, the seeds are very richly stored, and the young plant starts in life, able to draw for a time on these ready-made food-stuffs, until its green leaves are in a position to lay by starches and protoplasm in plenty for it. It draws by degrees upon the accumulated materials. Such plants are like capitalists who can start their sons well in life with a good beginning. On the other hand, the poppy has to set out on its career with a very poor equipment; it must begin picking up carbonic acid for itself almost from the outset. Such plants are like street arabs, compelled to shift as best they can from their earliest days. A coco-nut starts so well that the young palm can grow to a considerable size without working for itself; so to a less degree do walnuts, hazels, and oak-trees. Among other sets of plants there are two great groups which have especially learned to lay by food for their seedlings—the peaflower family and the grasses. In both these cases the young plants start in life with exceptional advantages. But what will feed a young plant will also feed an animal. Hence men live largely in different countries off such richly-stored seeds—among nuts, the coco-nut, the chestnut, and the walnut; among peaflower seeds, the pea, the bean, the vetch, the lentil; among grasses, wheat, rice, barley, Indian corn, rye, millet.

Recollect, however, that in all these cases the plant does not desire the seed to be eaten. It stored the tissues richly for its own sake and its offspring's alone, and we come and rob it. So, too, with the edible roots or tubers, such as potatoes, yams, turnips, beet-root, and so forth; the plant meant to use them for its own future growth; man appropriates them and disappoints its natural expectations. It is quite different with the succulent fruits, like the date and the plantain, which form in many countries the staple food of great populations; nature meant those to be eaten by animals, and offered the pulp in return for the benefit of dispersion.

Finally, when the seed is put into the ground and exposed to warmth and moisture, it begins to *germinate*. This it does by sending up a small growing shoot towards the light, which soon develops green leaves; as well as by sending down a root towards the earth, which soon begins to suck up water, together with the dissolved nitrogenous matter. That is the beginning of a fresh plant-colony, which thus owes its existence to two separate individuals, a father and a mother. The seed consists of two first seed-leaves in the fivefold plants, as you can see very well in a sprouting bean, and of one such seed-leaf in the threefold division, as you can see very well in a sprouting grain of wheat, or, still better, a lily seed. These earliest leaves are technically known as seed-leaves or *cotyledons*, and that is why the fivefold plants are known to botanists by the awkward name of *dicotyledons*, while the threefold are called *monocotyledons*. These names mean merely plants with two or with one seed-leaf.

and seeds, but little or nothing about the nature of the stems and branches that bear them. I have done this on purpose; for my object has been to give you as much information at a time as you could then and there understand, building up by degrees your conception of plant economy. Now, leaves and flowers are, so to speak, the units of the plant-colony, while stem and branches are the community as a whole and the mode of its organisation. You must know something about the component parts before you can get to understand the whole built up of them; you must have seen the individual citizens themselves before you can comprehend the city or nation composed by their union.

The stem, then, is the part of the plant-colony which does not consist of individual leaves, either digestive or floral, but which binds them all together, raises them visibly to the air, and supplies them with water, nitrogenous matter, and the results of previous assimilation elsewhere. The stem and branches are common property, as it were; they belong to the community: they represent the scaffolding, the framework, the canals, the roads, the streets, the sewers, of the compound plant-colony.

How did stems begin to exist at all? The most probable answer to that question we owe, not to any professional botanist, but to our great philosopher, Mr. Herbert Spencer.

The simplest and earliest plants, we saw, were mere small floating cells, endowed with active chlorophyll. Next in the upward order of evolution came rows of such cells, arranged in long lines, like hairs or threads, or like pearls in a necklace, as in the green ooze of ponds and lakelets. Above these simple plants, again, come flat expanded collections of cells, as in the fronds of seaweeds. Now, all these kinds of plant are stemless. But suppose in such a plant as the last, one frond or leaf took to growing out of the middle of another, as it actually does in many instances, we should get the beginning of a compound plant, many-leaved, and with a sort of early or nascent stem, formed by the part that was common to many of the leaves, like a midrib. The accompanying diagram (Fig. 49) will make this clearer than any amount of description could possibly make it. Starting from such a point, certain plants would soon find they were thus enabled to overtop others, and to obtain freer access to light and carbonic

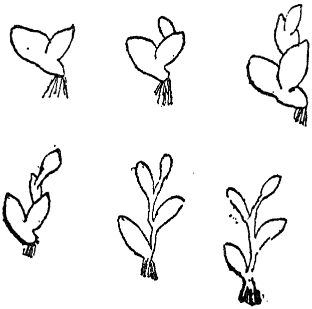


FIG. 49.—FIRST STEPS IN THE EVOLUTION OF THE STEM.

acid. Gradually, natural selection would ensure that the common central part of the growing plant, the developing stem, should become harder and more resisting than the rest, so as to stand up against the wind and other opposing forces. At last there would thus arise a clearly-marked trunk, simple at first, but later on branching, which would lift the leaves and flowers to a considerable height, and hang them out in such a way as to catch the sunlight and air to the best advantage, or to attract the fertilising insects or court the wind under the fairest conditions. I leave you to think out for yourself the various stages of the process by which natural selection must in the end secure these desirable objects.

In order to understand the nature of the stem, in its fully developed form, however, we must remember that it has three main functions. The *first* is, to raise the foliage, with the flowers and fruits as well, visibly above the surface of the ground on which they grow, so that the leaves may gain the freest possible access to rays of sunlight and to carbonic acid, while the flowers and fruit may receive the attentions of insects and birds, or other fertilising and distributing agents. The *second* is, to conduct from the root to the foliage and other growing parts what is commonly called the raw sap—that is to say, the body of water absorbed by the rootlets, together with the nitrogenous matter and food-salts dissolved in it, all of which are needed for the ultimate manufacture of protoplasm and chlorophyll. The *third* is, to carry away and distribute the various matured products of plant life, such as starches, sugars, oils, and protoplasm, from the places in which they are produced (such as the leaves) to the places where they are needed for building up the various parts of the compound organism (such as the flowers and fruit or the growing shoots), as well as to the places where such materials are to be stored up for safety or for future use (as, for example, the tubers and roots, or the buds, bulbs, and other dormant organs). Each of these three essential functions we must now proceed to consider separately.

In order to raise the leaves and branches visibly above the ground into the air above it, the stem is made much stronger and stouter than the ordinary leaf-tissue. If the plant does not rise very high above the ground, indeed, as in the case of small herbs, and especially of annuals, its stem need not be very hard or stiff, and is often in point of fact quite green and succulent. But just in proportion as plants grow tall and spreading, carry masses of foliage, and are exposed to heavy winds, do they need to form a stout and woody stem, which shall support the constant weight of the leaves, or even bear up under the load of snow which may cover the boughs in wintry weather. Thus, a tapering tree like the Scotch fir requires a comparatively smaller stem than an oak, because its branches do not spread far and wide, while its single leaves are thin and needle-like; whereas the oak, with its massive boughs extending far and wide on every side, and covered with a weight of large and expanded absorbent leaves, requires a peculiarly thick and buttressed stem to support its burden. Both in girth and in texture it must differ widely from the loose and swaying pine-tree. Every stem is thus a piece of ingenious engineering architecture, adapted on the average to the exact weight it will have to bear, and the exact strains of wind and weather to which on the average it may count upon being exposed in the course of its life-history. We see the result of occasional failure of adaptation in this respect after every great storm, when the corn in the fields is beaten down by hail, or the fir-trees in the forest are snapped off short like straw by the force of the tempest. But the survivors in the long run are those which have succeeded best in resisting even such unusual stresses; and it is they that become the parents of after generations, which of course inherit their powers of resistance.

Most stems, at least of perennial plants, and all those of bushes, shrubs, and forest trees, are strengthened for the purpose of resisting such strains by means of a material which we call *wood*. And what is wood? Well, it is an extremely hard and close-grained tissue, manufactured by the plant out of its ordinary cells by a deposit on their walls of thickening matter. This process of thickening goes on in each cell until the hollow of the centre is almost entirely filled up by the thickening material, leaving only a small vacant space in the very middle. The thickening matter, which consists for the most part of carbon and hydrogen, is built up there by the protoplasm of the cell itself: but as soon as the process is quite complete, the protoplasm emigrates from the cell entirely, and goes to some other place where it is more urgently needed. Thus wood is made up of *dead cells*, whose walls are immensely thickened, but whose living contents have migrated elsewhere.

In large perennial stems, like those of oaks and elms, a fresh ring of wood is added each year outside the ring of the last growing season. This new ring of wood is interposed between the bark (of which I shall speak presently) and the older wood of the core or heart, which was similarly laid down when the tree was younger. In this way, the number of rings, one inside another, enables us roughly to estimate the age of a tree when we cut it down; though, strictly speaking, we can only tell how many times growth in its trunk was renewed or retarded. Still, as a fair general test, the number of rings in a trunk give us an approximate idea of the age of the individual tree that produced it.

The principle is only true, however, of the great group of *dicotyledonous* trees, such as beeches or ashes, as well as of the pines and other conifers. In *monocotyledonous* trees, like the palms and bamboos, the stem does not increase in quite the same way from within outward, and there are therefore no rings of annual growth to judge by. Palms rise from the ground as big or nearly as big at the beginning as they will ever be in the end; and though

The second main function of the stem is to convey the raw sap absorbed by the roots to the leaves and branches, and especially to the growing points. This is such a very important element in plant life that we must now consider it in some little detail.

If you look for a moment at a great spreading oak-tree, with its top rising forty or fifty feet above the level of the ground, and its roots spreading as far and as deep beneath the earth, you will see at once how serious and difficult a mechanical problem it is for the plant to raise up water from so great a depth to so great a height without the aid of pump or siphon. For the plant can no more work miracles than you or I can. Yet every leaf must be constantly supplied with water, that prime necessary of life, or it will wither and die; and every growing part must obtain it in abundance, in order to give that plasticity and freedom which are needful for the earlier constructive processes. Protoplasm itself can effect nothing without the assistance of water as a solvent for all materials it employs in its operations.

How does the plant get over these difficulties? Well, the stem is well provided with a whole system of upward distributing vessels in which water may be conveyed to the various parts, Two main agents are employed for this purpose. The one is known as *root-pressure;* the other as *evaporation.*

I begin with the former. The cells of which roots are made up are most ingeniously constructed so as to exert this peculiar form of pressure. Each one of them has at its outer or free end, where it comes into contact with the moist earth, a wall of such a nature that it very readily absorbs water, and allows the water so absorbed to flow freely through it inward. But once in, the water seems almost as if imprisoned in a pump; it cannot pass outward again, only inward and upward. You may compare the cell in this respect with those mechanical valves which yield readily to the pressure of fluids from outside, but instantly close when a fluid from inside attempts to pass through them. In this way the outer cells of the hairs on the roots, which come in contact with the moistened soil, get distended with water, and swell and swell, till at last their walls will give no longer, and their own elasticity forces the water out of them. But the water cannot flow back; so it has to flow forward. Again, each cell or vessel which the stream afterwards enters is constructed on just the same general principle as the absorbent root-cells; it allows water to pass into it freely from below upward, but does not allow it to pass back again from above downward. Thus we get a constant state of what is called *turgidity* in the lower cells; they are as full as they can hold, and they keep on contracting elastically, so as to expel the water they contain into other cells next in order above them. By means of such root-pressure, as it is called, raw sap is being for ever forced up from the soil beneath into the stem and branches, to supply the leaves with water and food-salts, especially in early spring, when the processes of growth are most active and vigorous.

It is owing to this peculiar property of root-pressure that cut stems "bleed" or exude sap, especially in spring-time. The root-pressure continues of itself in spite of the fact that the stem has been divided; and the sap absorbed by the roots is thus forced out at the other end by the continuous elasticity of the cells and vessels. The fact that severed stems will thus "bleed" or exude raw sap shows in itself the reality of root-pressure.

But root-pressure alone would not fully suffice to raise so large a body of water as the plant requires to so great a height above the earth's surface. It is therefore largely supplemented and assisted by the second or subsidiary power of evaporation. This evaporation, or "transpiration" as it is generally called, is just as necessary and essential to plants as breathing is to men and animals.

We must therefore enter a little more fully here into the nature of so important and universal a plant function. You will remember that when we were discussing the nature of leaves, I gave you a woodcut of a thin slice through a leaf (Fig. 1) which showed the blade as naturally divided into an upper and under portion. The upper portion consisted of very close-set green cells, containing living chlorophyll, and covered by a single transparent water-layer, which absorbed carbonic acid from the air about, and passed it on to be digested by the living chlorophyll-layer just beneath it. But the under portion was sparse-looking and spongy; it was composed of cells loosely arranged among themselves, and interspersed with great empty spaces. I told you but little at the time of the function or use of this lower portion; we must return to it now in the present connection, as a component element in the task of water-supply.

The lower portion of most leaves is the part employed in the great and necessary work of evaporation.

For this purpose the tissue at the under side of the leaf is composed of loose and spongy cells which have much of their surface exposed to the empty spaces between them: and these empty spaces are really air-cavities. The object of the cavities, indeed, is to facilitate evaporation. Liquid transpires into them from the various cells through the wall that bounds them. How fast water evaporates in the leaves of plants we all know by experience in a thousand ways. We know, for instance, that if we pick bunches of flowers and leave them in the sun without water, they fade and dry up in a very short time. We also know that if we forget to water plants in pots, the plants similarly dry up and die after a few hours' exposure. Leaves, in fact, are purposely arranged in most cases so as to encourage a very rapid evaporation; and evaporation is one of their chief means of raising water from the roots to the growing and living portions.

If you examine the under side of a leaf under the microscope, you will find it is covered by hundreds of little pores which look exactly like mouths, and which are guarded by two cells whose resemblance to lips is absurdly obvious. These pores are commonly known to botanists by the awkward name of *stomata*, which is the Greek for *mouths;* and mouths they really are to all external appearance. You must not suppose, however, that they are truly mouths in the sense of being the organs with which the plant eats; the upper surface of the leaf, as we saw, with its layer of water-cells and its assimilating chlorophyll-bodies, really answers in the plant to our mouths and stomachs. The *stomata* or pores are much more like the openings in the skin by which we perspire; only perspiration or evaporation is an even more important part of life to the plant than it is to the animal. Each of the *stomata* opens into an air-cavity; and through it the liquid evaporated from the cells passes out as vapour into the open air. Many leaves have thousands of such pores on their lower surface; they may easily be recognised under the microscope by means of the curious guard-cells which look like lips, and which give the pores, in fact, their strange mouth-like aspect.

What is the use of these lips? Well, they are employed for opening and closing the evaporating pores, or *stomata*. In dry weather it is not desirable that the pores should be open, for then evaporation should be limited as far as possible. So, under these conditions, the lips contract, and the pore closes. Excessive evaporation at such times would, of course, damage or destroy the foliage; the plant desires rather to store up and retain its stock of moisture. But after rain, and in damp weather, the roots suck up abundant water; and then it becomes desirable that evaporation should go on, and the leaves and growing shoots should be supplied with liquid food, as well as with the nitrogenous matter and salts dissolved in it. Hence at such times the pores open wide, and allow the water in the form of vapour to exude from them freely.

The object of this evaporation, again, is twofold. In the first place, it supplements root-pressure as a means of raising water to the leaves and growing shoots; and in the second place, by getting rid of superfluous liquid, it leaves the nitrogenous material and the food-salts in a more concentrated form, at the very points where they are just then needed for the formation of fresh living protoplasm and other useful constructive factors of plant-life. But how does evaporation raise water from the ground? In this way. The living contents of each cell on the upward path have a natural chemical affinity for water, and will suck it up greedily wherever they can get it. Thus each part, as fast as it loses water by evaporation, takes up more water in turn from its next neighbour below; and that once more withdraws it from the cell beneath it; and so on step by step until we reach the actual absorbent root-hairs. Root-pressure by itself could not raise water as high as we often see it raised in great forest trees and tropical climbers; it has not enough mechanical motor power. But here evaporation comes in, to aid it in its task; and the real motor power in this last case is the very potent force of chemical attraction.

What I have said here about evaporation, and the way it is conducted by means of pores on the surface of the leaves, is true of the vast majority of green plants; but considerable varieties and modifications occur, of course, in accordance with the necessities of various situations. For example, the brooms and many other shrubs of the same twiggy type have few green leaves, but in their stead produce lithe green stems, filled with active chlorophyll. These stems and branches do all the work usually performed by ordinary foliage. Stems and twigs of this type are covered with mouth-like pores, or *stomata,* in exactly the same way as the under side of leaves in most other species. Similarly, the very flattened leaf-like branches of the butcher's broom, and of the Australian acacias and other Australasian trees, are well supplied with like pores for purposes of evaporathe lower side, which is in contact with the water. Some leaves have the *stomata* on both sides alike, especially when no one side is much more exposed to sunlight than another. But wherever they are found, they always lie above masses of loose and spongy cell-tissue, in whose meshes and air-spaces evaporation can go on readily.

On the other hand, as I noted before, leaves which grow in very dry or desert situations require as much as possible to curtail evaporation. Such leaves are therefore usually thick and fleshy, and possess a very small allowance of pores. The forms of several leaves, again, are largely dependent upon the necessity for keeping the pores free from wetting, and promoting evaporation whenever it is needful for the plant's health and growth; and this is particularly the case with what are called "rolled leaves," such as one sees in the heaths and the common rock-roses. Many such additional principles have always to be taken into consideration in attempting to account for the various shapes of foliage: indeed, we can only rightly understand the form of any given leaf when we know all about its habits and its native situation.

The stem, then, besides raising the leaves and flowers, for which purpose it is often strengthened by means of mechanical woody tissue, also acts as a conductor of raw sap from the tips of the roots to the leaves and growing points, for which purpose it is further provided with an elaborate system of canals and vessels, running direct from the absorbent root to all parts of the compound plant community.

The third function of the stem and branches is to convey and distribute the elaborated products of plant-chemistry and plant-manufacture from the places where they are made to the places where they are needed for practical purposes.

We saw long since that starches, sugars, protoplasms, and chlorophyll are manufactured in the leaves under the influence of sunlight; and from the materials so manufactured every part of the plant must ultimately be constructed. But we never said a word at the time about the means by which the materials in question were carried about and distributed to the various organs in need of them. Nevertheless, a moment's consideration will show you that new leaves and shoots must necessarily be built up at the expense of materials supplied by the older ones; that flowers, fruits, and seeds must be constructed from protoplasm handed over for their use by the neighbouring foliage. Nay more; the root itself grows and spreads; and the very tips of the roots, which themselves of course can manufacture nothing, must be supplied from above with most active and discriminating protoplasm, to guide their movements. Whence do they get it? From the factory in the foliage. Thus, from the summit of the tallest tree down to the lowest root that fastens it in the soil, there runs a complex system of pipes and tubes for the special conveyance of elaborated material; and this system supplies every growing part with the food-stuff necessary for its particular growth, and every living part with the food-stuff necessary for maintaining its life and activity. An interchange of protoplasmic matter, starches, and sugars, goes on continually through the entire organism.

This downward and outward stream of living matter, carrying along with it live protoplasm and other foods or manufactured materials, must be carefully distinguished from the upward stream of crude sap which rises from the roots to the leaves and branches. The one contains only such raw materials of life as are supplied by the soil—namely, nitrogenous matter, water, and food-salts; the other contains the things eaten from the air by the plant in its leaves, and afterwards worked up by it into sugars, starches, protoplasm, and chlorophyll.

Stems are usually covered outside for purposes of protection by a more or less thick *integument*, which in trees and shrubs assumes the corky form we know as *bark*. Bark consists of dead and empty cells, thickened with a lighter thickening matter than wood, and presenting as a rule a rather spongy appearance. But beneath the bark comes a distinct layer of living material, interposed between the corky dead cells of the integument and the woody dead cells of the interior. This living layer extends over stem, twigs, and branches: it forms the binding and connecting portion of the entire plant community; it links together in one united whole the living material of the leaves and shoots with the living material of the roots and rootlets. It is thus the stem, above all, that gives to the complex plant colony of foliage and flowers whatever organic unity and individuality it ever possesses.

All situations, however, are not alike. Just as here this sort of leaf succeeds, and there that, so in stems and branches, here this form does best, and there again the other. The shape of the stem and branches, in fact, is the shape of the entire plant colony; and it is arranged to suit, on the average of instances, the convenience of all its component members. Much depends on the shape of the leaves; much on the conditions of wind or calm, shade or sunshine.

Some plants are annuals. These require no large and permanent stem; they spring from the seed each year, like peas, or wheat, or poppies; they make a stem and leaves; they produce their flowers; they set, and ripen, and scatter their seed; and then they wither away and are done with for ever. Hundreds of such plants occur in our fields and gardens. Even these annuals, however, differ greatly in the amount of their stem and branches. Some are quite low, humble, and succulent, like chickweed and sandwort; others have tall and comparatively stout stems, like wheat, oats, and barley, or still more, like the sunflower. As a rule, annuals are not very large; but a few rich seeds produce strong young plants which even within a single year attain an astounding size; this is the case with the garden poppy, the tobacco plant, and the Indian corn, and even more so with certain climbing annuals, such as the gourd, the cucumber, the melon, and the pumpkin.

Many plants, however, find it pays them better to produce a hard and woody stem, which lasts from year to year, and enables them to put forth fresh leaves and shoots in each succeeding season. Among these, again, great varieties exist. Some have merely a rather short and stout stem with many bundles of water-vessels, as in the pink and the wallflower. Their growth is *herbaceous*. Others, however, produce that more solid form of tissue which we know as wood, and which is made up of cells whose walls have become much thickened and hardened. Among the woody group, again, we may distinguish many intermediate varieties, from the mere shrub or bush, like the heath and the broom, through small trees like the rhododendron, the lilac, the hawthorn, and the holly, to such great spreading monsters of the forest as the oak, the ash, the pine, the chestnut, and the maple.

Once more, some plants produce an underground stem, and send up from this fresh annual branches. That is the case with hops, with meadow-sweet, and with buttercup, as well a with many of our garden flowers. When a plant becomes perennial, it is a mere question o its own convenience whether it chooses to produce a thick and woody stem, like trees and bushes or to lay up material in underground roots stocks, and branches, like the potato, the dahlia the lilies, the bulbous buttercup, the crocus, the iris, the Jerusalem artichoke, and the meadow orchis.

Ordinary people divide most plants into three groups—herbs, shrubs, and trees. But I think you will have seen from what I have just said, that in every great family of plants different kinds have found it worth while to adopt any one of these forms at will, according to circumstances. Trees, in other words, do not form a natural group by themselves; any family of plant may happen to develop a tree-like species. Thus the herb-like clover and the tall tree-like laburnum are closely related peaflowers. Most of the composites are mere herbs or shrubs, but a very few of them in the South Sea Islands have grown into large and much-branched trees. The grasses are mainly herbs; but some of them, like the bamboos, have developed tall and tree-like stems, much branched and feathery.

Take the single family of the roses, for example, so familiar to most of us; some of them are mere annual weeds, like the tiny parsley-piert that occurs as a pest in every garden. Others, again, are perennials with low tufted stems, like the strawberry; or creeping, like the cinquefoil; or rising into a spike, like the burnet and the agrimony. Yet others become scrambling bushes, like the blackberry and the raspberry. In the blackthorn and the hawthorn the bush has become more erect and tree-like. Both types of growth occur in the dog-rose and many other roses. The cherry attains the size and stature of a small tree. The mountain-ash is bigger; the apple-tree bigger still; while the pear often grows to a considerable height and much spreading dignity. These are all members of the rose family. Here, therefore, every variety of shape and size is well represented within the limits of a single order.

One word must be given to the varieties of the stem. Sometimes, as in the oak, the trunk is much branched and intricate; sometimes, as in the date-palm, simple and unbranched, bearing only a single tuft of circularly arranged leaves. But the most interesting in this respect are the climbing and twisting stems, which do not take the trouble to support themselves, but lean for aid upon the trunk of some stronger and more upright neighbour. Stems of this sort are familiar to us all in the hop and the bindweed. In other climbers the stems do not twine to any great extent, but the plants support themselves by root-like processes, as in ivy, or by tendrils, as in the vine, or by twisted leaf-stalks, as in the canary creeper. Others cling by means of suckers, as the *Ampelopsis Veitchii*, or hang by opposite leaves, like clematis, or cling by hooked hairs, as is the case with cleavers. In certain instances, such creeping or climbing plants tend to become parasitic—that is to say, they fasten flowers.

Other plants show another form of parasitism. Misletoe is one of these. It fastens itself to a poplar or an apple-tree (very seldom an oak) and sucks its juices. But it has also green leaves of its own, which do real work of eating and assimilating as well. It is therefore not quite such a parasite as the dodder. Several plants are similarly half-parasitic on the roots of wheat and grasses. Among them I may mention, as English instances, the cow-wheat, the yellow rattle, and the pretty little eyebright.

Broomrape is a parasite of a different sort. It grows on the roots of clover, and has no true leaves; in their place it produces short scales, which contain no chlorophyll. Several other plants are also devoid of chlorophyll, and therefore cannot eat carbonic acid for themselves. They live like animals on materials laid by for them by other plants. Such are toothwort, a pale rose-coloured leafless plant, with pretty spiked flowers, which grows by suckers on the roots of hazel-trees. The bird's nest orchid, a delicate brown plant with curious ghost-like blossoms, feeds rather on the organised matter in decaying leaves among thick beechwoods. In this book I have purposely confined your attention for the most part to the true green plants, which are the central and most truly plant-like type; but I ought to tell you now that a great many plants, especially among the lower kinds, behave in this respect much more like animals: instead of manufacturing fresh starches and protoplasms for themselves from carbonic acid, under the influence of sunlight, they eat up what has already been made by other and more industrious species. Such plants are retrograde. They are products of degeneracy. Among them I may specially mention all the fungi, like mushrooms, toadstools, mould, and mildew, as well as the bacilli and bacteria, microscopic and degenerate plants which cause decomposition. Their life is more like that of animals than of true vegetables.

In tropical forests, where the soil is almost monopolised by huge spreading trees, the smaller plants have been forced to secure their fair share of light and air by somewhat different means from those which are common in cooler climates. Many of them, without being parasitic, have learnt to attach themselves by their roots to the outer bark of the trees, and so to get at the light, no ray of which ever struggles through the living canopy of green in the dense jungle. These plants have green leaves, and eat for themselves; but they use the boughs of their host instead of soil to root themselves in. Such plants are technically known as epiphytes. This is the mode of life of most of the handsome orchids cultivated in our conservatories.

Now let us recapitulate. The stem unites the organs. It supports and raises the whole plan colony. Finally, it stores up material i drought or winter, which it uses for nev branches, leaves, or flowers, when rain o spring or favourable conditions in due tim come round again.

CHAPTER XIII.

SOME PLANT BIOGRAPHIES.

We have considered so far the various element which go to make up the life of plants—hov they eat and drink, how they digest and assimilate, how they marry and get fertilised, how the produce their fruit and set their seeds, finall how they are linked together in all their part by stem and vessels into a single community But up to the present moment we have considered these elements in isolation only, as s many processes the union of which makes u what we call the life of an oak, or a lily, o a strawberry plant. In order really to understand how all these principles work together i practical action, we ought to take a few specime lives of real concrete plants, and trace then through direct, from the cradle to the grave with all their vicissitudes. I propose, therefore, in this chapter to give you brief sketches of one or two such life-histories; and I hope these few hints may encourage you to find out many more for yourself, by personal study of plants in their native surroundings.

"In their native surroundings," I say, since all life is really, in Mr. Herbert Spencer's famous phrase, "adaptation to the environment;" and therefore we can only understand and discover the use and meaning of each part or organ by watching the plant in its own home, and among the general conditions by which it and its ancestors have always been limited. It would be impossible, for example, to see the use of the thick outer covering of the coconut (from which coconut matting is manufactured) if we did not know that the coconut palm grows naturally by the sea shore in tropical islands, and frequently drops its fruits into the water beneath it. The nuts are thus carried by the waves and currents from islet to islet; and the coconut palm, which is a denizen of sea-sand, owes to this curious method of water-carriage its wide dispersion among the coral-reefs of the Pacific. But a plant that is so dispersed must needs make provision against wetting, bruising, and sinking in the sea; and since only those coconuts would get dispersed over wide spaces of water which happened to possess a good coating of fibre, the existing plant has come to produce the existing nut as we know it—richly stored with food for the young palm while it makes its first steps among the barren rocks and honey at a depth of eighteen inches. Now, no European insect could possibly reach so deep a deposit; but a Madagascar moth has a gigantic proboscis, exactly fitted for sucking the nectary and fertilising the flowers. Thus no plant can properly be understood apart from its native place; and I have therefore confined myself for the most part in these few brief life-histories to native British plants, whose circumstances and surroundings are known to everybody.

As an example of a very simple and easy life-history, I will take first a little wayside weed, commonly known as whitlow-grass, but called by botanists, in their scientific Latin, *Draba verna*. This curious little herb is not a grass at all (as its name might make you think), but a member of the great family of the crucifers, succulent plants with four petals and six stamens in each flower, to which the cabbage, the turnip, the sea-kale, and many other well-known garden species belong. But whitlow-grass is not a large and conspicuous plant like any of these; it is one of the smallest and shortest-lived of our British weeds. It has managed to carve itself out a place in nature on the dry banks and in clefts of rock during the few weeks in spring while such spots are as yet unoccupied by more permanent denizens. The herb starts from a very minute seed, dropped on the soil by the parent plant many months before, and patiently waiting its time to develop till winter frosts are over, and warmer weather and moisture begin to quicken its tiny seed-leaves. As soon as these have opened and used up their very small stock of internal nutriment, the young plant begins to produce on its own account a rosette of little oblong green leaves, pressed close to the ground for warmth and shelter. They eat as they go, and make fresh leaves again out of the absorbed and assimilated material. Direct sunshine falls upon them full front; and as no other foliage overshadows them or competes in their neighbourhood for carbonic acid, they grow apace into a little tuft of spreading leaves, about half an inch long or less, and forming in the mass a rough circle. For about a week or ten days the little mouths go on drinking in carbonic acid as fast as they can, and manufacturing it under the influence of sunlight into starches and protoplasm. At the end of that time they have collected enough material to send up a slender blossoming stem, about an inch high or more, bearing no leaves, but developing at the top a few tiny flower-buds. These shortly open and display their flowers, very small and inconspicuous, with four wee white petals, each so deeply cleft that they resemble eight to a casual observer. Inside the petals are six little active stamens; and inside the stamens again a two-celled ovary. The blossoms are visited and fertilised on warm March mornings by small spring midges, attracted by the petals. They leaves and roots wither, as the material they contained is rapidly withdrawn from them, and used up in the process of maturing the seeds; so that as soon as the fruiting is quite complete, the plant dies down, having exhausted itself utterly in the two short acts of flowering and seed-bearing. During the remaining ten months of the year or thereabouts, there are no more whitlow-grasses at all in existence; the species remains dormant, as it were, for a whole long period in the form of seeds lying buried in the soil, and only springs to life again when the return of March gives it warning that its day has once more come round to it.

Contrast with this brief and very spasmodic life of some thirty days the comparatively long though otherwise extremely similar biography of the Mexican agave, commonly cultivated in hothouses in England, and largely grown in the open air in the South of Europe under the (incorrect) name of "American aloes." The agave is a large and strikingly handsome lily of the amaryllis family, about which I have already told you something in a previous chapter. It begins life as a small plant, like a London pride, springing from a comparatively large and richly-stored seed on its own dry prairies. Its leaves, which spread in a rosette, are not unlike those of the house-leek in shape; they are very large, thick, and fleshy. But as they grow in the hot and dry climate of Mexico, an almost desert country, with a very small rainfall, they have a particularly hard outer skin, so as to prevent undue evaporation; and they are protected against the attacks of herbivorous animals by being spiny at the edges, and ending in a stout and dagger-like point of the most formidable description. The centre of the plant is occupied by a sort of sheath of leaves, concealing the growing point. For several years the round bunch of outer leaves grows bigger and bigger, till it attains a diameter of ten or fifteen feet at the base, seeming still like a huge rosette, with hardly any visible stem to speak of. Meanwhile these huge leaves are busy all the time, eating and assimilating, and storing up manufactured food-stuffs as hard as they can in their thick and swollen bases. After six or seven years in their native climate, the plant feels itself in a position to send up a flowering stalk, which is formed from the materials already laid by in these immensely thick and richly-stored leaf bases. The stalk springs from the middle of the central leaf-sheath. In a very few weeks the agave has sent up from this point a huge flowering scape, twenty or thirty feet high, and a foot or fifteen inches thick at the bottom. On this scape it produces with extraordinary rapidity a vast number of large and showy yellow flowers, which look not unlike an enormous candelabrum, with many divided branches. The plant is enabled to produce this immense flowering stem and these numerous flowers in so short a period, store of valuable food-stuffs; so that by the time the seeds are ripe, the whole plant is used up, having exhausted itself, like the tiny whitlow-grass, in the act of fruiting. It then dies down altogether, and never recovers, though new plants or offsets usually develop at its base from side buds, after the original agave has begun to wither. In English hothouses it takes thirty or forty years before the agave has collected enough material to send up a stem and flower; hence the common exaggeration that it needs a hundred years for "the blossoming of an aloe."

As a familiar example of a very different kind of perennial plant, we may take our English beech-tree. The beech sets out in life as a tender young seedling, which grows from a good-sized triangular nut, whose cotyledons are well-stored with food-stuffs for its early development. As the nut germinates, the cotyledons open out, become flat and green, like thick fleshy leaves, and begin to absorb carbonic acid from the air, which they work up at once with the material supplied by the tiny root into protoplasm and chlorophyll. In the angle between them a young shoot develops, which soon puts forth delicate blades of true foliage leaves; and these in turn grow and assimilate material under the influence of sunlight. In the first year the little beech-tree is but a tiny sapling, with a short stem, already woody; but year after year, this stem grows higher, branches out and divides, and slowly clothes itself in the smooth grey bark characteristic of the species. The particular way in which it branches is this: each autumn there is formed at the base of every leaf a winter bud, long and brown, and covered with close scales, which enable it to survive the cold of winter. When spring comes round again, each one of these buds develops in turn into a leafy branch, so that (accidents excepted) there are as many new branches or twigs every year as there were leaves on the tree in the preceding season. The young leaves and branches emerge slowly and cautiously from the buds in spring, for fear of frost; they are protected at first by certain scaly brown coverings known as stipules. Gradually, however, as the weather grows warmer, the stipules fall off, and display the tender green leaves, exposed to the air, but still folded together. As soon as they can trust the season, however, the leaves unfold, though they are still thickly covered at the edges by protective hairs, which afterwards fall off, but which guard the fresh green chlorophyll in the cells just at first both from chilly winds and from the injurious effect of excessive sunlight. Year after year the beech-tree grows by so subdividing and adding branch to branch; while its stem increases by yearly rings of growth, till it attains at length considerable dimensions.

During many such seasons of growth the beech-tree does not flower; all the material it manufactures through the summer in its large flat leaves it lays by in its stem to supply the young shoots and branches at the beginning of the subsequent season. But at last, when it has reached the height and girth of a small tree, it begins to store up protoplasm and starches for blossom also. Some of its buds are now leaf-buds, but some are flower-buds, produced in autumn, and held over till April. In the spring these flower-buds lengthen and produce bunches of blossoms, which we call catkins, some of them males, and some females, but both sexes growing on the same tree together. They bloom, like most other catkins, in the early spring, while the leaves are still very little developed, so as to prevent the foliage from interfering with the carriage of the pollen. The males are produced in hanging clusters an inch or so long; while the females stand up in small globular bunches, on erect flower-stems. They are wind-fertilised; and shortly after flowering, the male catkins drop off entire, having done their life-work, while the females swell out into the familiar husks or four-valved cups, containing each some two or three triangular nuts, richly stored with food-stuffs.

The agave only flowers once, and then dies down, exhausted. But the beech goes on flowering for many years together, and grows meanwhile larger and larger in bulk, its trunk increasing in girth, and becoming buttressed at the base, so as to support the large head of branches and the dense mass of foliage. For the boughs are so arranged that a great crown of leaves is exposed in summer to the sun and air at the outer circumference of the dome-shaped mass; and in this way every leaf gets its fair share of light and carbon, and interferes as little as possible with the work of its neighbours. Old beeches will grow to more than 100 feet in height, and live for probably three or four centuries. At last, however, their protoplasm grows old and seems to get enfeebled; the trunk decays, and the entire tree falls first into dotage, then dies by slow degrees of pure senility.

The common vetch is another familiar plant whose life-history introduces to us some totally different yet interesting features. It belongs to the wide-spread family of the peaflowers, to which I have already more than once alluded, and it takes its origin from a comparatively large and rich round seed, not unlike a pea, whose cotyledons are well stored with supplies of starch and other food-stuffs. It sends up at first a short spreading stem, which twines or trails over surrounding plants, developing as it goes very curious leaves of a compound character. Each leaf consists of five or six pairs of leaflets, placed opposite one another on the common stalk in the feather-veined fashion. But the four or five leaflets at the end of each leaf-stalk do not develop any flat blade at all, and are quite unleaflike in appearance: they are transformed, indeed, into long thin tendrils, which catch hold of neighbouring branches or stems of grasses, twine spirally round them, and so enable the vetch to climb up bodily in spite of its weak stem, and raise its leaves and flowers to the air and the sunlight.

At the base of every leaf, again, you will find, if you look, two arrow-shaped appendages, which block the way up the stem towards the developing flowers for useless creeping insects such as steal the honey without assisting fertilisation. On each appendage is a curious black spot, the use or function of which is not apparent while the blossoms are in the bud. But after a few weeks' growth, the vetch begins to produce solitary flowers in the angle of each upper leaf; flowers of the usual pea-blossom type, but pink or reddish purple, and handsome or attractive. These flowers contain abundant honey to allure the proper fertilising insects. Just as they open, however, the black spot on the arrow-headed appendages of the lower leaves, in whose angles there are no flowers, begins also to secrete a little drop of honey.

What is the use of this device? Well, if you watch the vetch carefully, you will soon see that ants, enticed by the smell of honey in the opening flowers, crawl up the stem in hopes of stealing it. But ants, as we know, are thieves, not fertilisers. As soon as they reach the first black spot, they stop and lick up the honey secreted by the gland, and then try to pass on to the next appendage above it. But the arrow-shaped barbs, turned back against the stem, block their further progress; and even if they manage to squeeze themselves through with an effort, they are met just above by another honey-gland and another barrier in the shape of a second arrow-shaped appendage. No ant ever gets beyond the third or fourth barricade; the device is efficient: the vetch thus offers blackmail to creeping thieves in the shape of stem-honey, in order to guard from their depredations the far more valuable and useful honey in the flowers, which is intended to attract the fertilising insects.

When the purple flowers have in due time been fertilised, they produce long narrow pods, each containing about a dozen round pea-like seeds. As the pods ripen, the plant shrivels up, and usually dies away, leaving only the ripe seeds to represent its kind through the winter. But sometimes, in damp and luxuriant autumns, the stem struggles through the winter to a second season, and flowers again in the succeeding summer. We express this fact as a rule by saying that the vetch is usually an annual, but occasionally a biennial.

With most annuals, such as wheat or sunflower, the whole strength of the plant is used up in the production of seed; and as soon as the seed is set, the plant dies immediately. Where annuals have the sexes on separate plants, however, the male plants die as soon as they have shed their pollen, their task being thus complete; while the females live on till their seed has ripened.

Common coltsfoot is another well-known plant whose life-history shows some points of great interest. It grows in the first instance from a feathery fruit, one-seeded and seed-like, which is carried by the wind, often from a great distance. These flying fruits alight at last upon some patch of bare or newly-turned soil, such as the bank of a stream where there has been lately a landslip, or the side of a railway cutting. These bare situations alone suit the habits of the baby coltsfoot; if the fruit happens to settle on a light soil, already thickly covered with luxuriant vegetation, it cannot compete against the established possessors. But the winged fruits, being dispersed on every side, enable many young plants to start well in life on the poor stiff clays which best suit the constitution of this riverside weed. The seedling grows fast in such circumstances, and soon produces large angular leaves, very broad and thick, which in the adult plant have often a diameter of five or six inches. They are green above, where they catch the sunlight and devour carbonic acid; but underneath they are covered with a thick white wool, which is there for a curious and interesting purpose. The damp clay valleys and river glens where coltsfoot lives by choice are filled till noon every day with mist and vapour; and heavy dew is deposited there every night through the summer season. Now, if this dew were allowed to clog the evaporation pores or *stomata* on the leaves of coltsfoot, the plant would not be able to raise water or proceed with its work except for perhaps a few hours daily. To prevent this misfortune, the under side of the leaves is thickly covered with a white coat of wool, on which no dew forms, and off which water rolls in little round drops, as you have seen it roll off a serge table-cloth. By this ingenious device the coltsfoot manages to keep its evaporation pores dry and open, in spite of its damp and moisture-laden situation. One may say, indeed, that every point in the structure of every plant has thus some special purpose; indeed, one large object of the study of plants is to enable us to understand and explain such hidden purposes in the economy of nature.

During its early life, once more, the young plant of coltsfoot is constantly engaged, like the whitlow-grass and the agave, in laying by material for its future flowering season. But it does not lay by, as they do, in its expanded leaves or other portions of its body visible above ground; instead of that, it puts forth a creeping underground stem or root-stock, which pushes its way sideways through the tough clay soil, often for several feet, and sends up at intervals groups of large roundish leaves, such as I have already described, to work above ground for it. You might easily take each such group for a separate plant, unless you dug up the root-stock and saw that they were really the scattered foliage of one subterranean stem, which grows horizontally instead of upward. During the summer the coltsfoot lays by in this buried root-stock quantities of rich material for next year's leaves and for its future flowers. In winter the leaves die down, and you see not a trace of the plant above ground. But in very early spring, as soon as the soil thaws, certain special buds begin to sprout on the underground stem, and send up tall naked scapes or flower-stems, usually growing in tufts together, and each crowned by a single large fluffy yellow flower-head. These stems are covered below by short purplish scales; and their purple colouring matter enables them to catch and utilise to the utmost the scanty sunshine that falls upon the plant in chilly March weather. For this particular colouring matter has the special property of converting the energy in rays of light into heat for warming the plant. The scape is also wrapped up in a sort of cottony wool, which helps to keep it warm ; and the unopened flower-head turns downward at first for still further safety against chill or injury. These various devices enable the coltsfoot to blossom earlier in the season than almost any other insect-fertilised flower, and so to monopolise the time and attention of the first flower-haunting March insects.

Coltsfoot is a composite by family; so its flowers are collected together into a head, after the ancestral fashion, and enclosed by an involucre which closely resembles a calyx. But the type of flower-head differs somewhat from that in any of the composite plants I have hitherto described for you, because its outer florets are not flat and ray-shaped, but strap-like or needle-shaped. The inner florets, however, are bell-shaped, and much like those of the common daisy. The naked scapes, each resembling to the eye a shoot of asparagus, and each crowned by a single fluffy yellow flower-head, are familiar objects on banks or railway cuttings in the first days of spring; I have known them open as early as the 12th of January, in sunny weather. But they grow entirely without leaves, and are produced at the expense of the material laid up in the underground stem by last season's foliage. They blossom, are fertilised, set their seeds, turn into heads of white feathery down, and produce ripe fruits which blow away and get dispersed, all before the leaves begin to appear at all above the soil. Thus you never can see the foliage and flowers together; it is only by close observation that you can discover for yourself the connection between the heads of yellow flowers which come up in early spring, and the groups of large angular woolly leaves which follow them in the same spots much later in the season.

The life-history of the coltsfoot introduces us also to another conception which we must clearly understand if we wish to know anything about many plant biographies. I have said already that parts of one and the same coltsfoot plant might easily be mistaken for separate individuals; and, indeed, if the stem gets severed, particular groups of leaves may live on as such, in two or more distinct portions. This leads us on to the consideration of a great group of plants like the common wild strawberry, in which a regular system of subdivision exists, and in which new plants are habitually produced by offsets or runners, as well as by seedlings. Such a method of increase is to some extent a survival into higher types of the primitive mode of reproduction by subdivision.

A strawberry plant grows in the first instance from a seed, which was embedded in a carpel or seed-like fruitlet on the ripe red swollen receptacle which we commonly call a strawberry. This seed germinates, and produces a seedling, which puts forth small green leaves, divided into three leaflets each at the end of a long and slender leaf-stalk. As it grows older, however, besides its own tufted perennial stem or stock, it sends out on every side long branches or runners, which are in fact horizontal or creeping stems in search of new rooting places. These stems run along the ground for some inches, and then root afresh. At each such rooting-point, the plant sends up a fresh bunch of leaves, which gradually grows into a distinct colony, by the decay of the intermediate portion or runner. Again, this new plant itself in turn sends forth runners in every direction all round it; so that often the ground is covered for yards by a network of strawberry plants, all ultimately derived from a single seedling. Theoretically, we must regard them all as severed parts of one and the same plant, accidentally divided from the main stem, since only the union of two different parents can give us a totally distinct individual. But practically they are separate and independent plants, competing with one another thenceforth for food, soil, and sunshine.

A great many plants are habitually propagated in such indirect ways, as well as by the normal method of flowering and seeding. Indeed, it is difficult to separate the two processes of mere growth, as shown in budding or branching, and reproduction by subdivision, as shown in the springing of saplings from the roots or stem, the production of runners, the division of bulbs, and the rooting of suckers. I will therefore give here a few select instances of these frequent incidents in the life-history of various species.

The tiger-lilies of our gardens produce little dark buds, often called bulbils, in the angles of their foliage leaves. These buds at last fall off and root themselves in the soil, forming to all appearance independent plants. Much the same thing happens with many English wild-flowers. For example, in the plant known as coral-root (allied to the cuckoo-flower) little bud-bulbs are formed in the angles of the leaves, which drop on the damp soil of the woods where the plant grows, and there develop into new individuals. In this last-named case the plant seldom sets its fruit at all, the reproduction being almost entirely carried on by means of the bulbils. Such instances suggest to us the pregnant idea that a seed is nothing more than a bud or young shoot, to whose making two separate parents have contributed. There is, in short, no essential difference between the two processes of growth and reproduction.

Again, in the common lesser celandine the root-stock emits a large number of tiny pill-like tubers, which grow and lay by rich material underground (derived from the leaves) during the summer season. In the succeeding spring, however, each of these tubers develops again into a separate plant, in a way with which the familiar instance of the potato has made us familiar. In the crocus, once more, and many other bulbous plants, several small bulbs are produced each year by the side of the large one, and these smaller bulbs are of course, strictly speaking, mere branches of the original crocus-stem. But they grow separate at last, by the decay or death of the central bulb, and themselves in turn produce at their side yet other bulbs, which become the centres of still newer families. We may parallel these cases with those of trees whose boughs bend down and root in the ground so as to become in time independent individuals; or with runners like those of the strawberry and the creeping buttercup, which root and grow afresh into separate plantlets.

Sometimes still more curious things happen to plants in the way of reproduction by subdivision. There is an English pondweed, for example, which grows in shallow pools liable to be frozen over in severe winters. As cold weather approaches, the top of the growing shoots in this particular pondweed break off of themselves, much as leaves do at falling time. But they break off with all their living material still preserved within them undisturbed; and they then sink and retire to the unfrozen depths of the pond, where they remain unhurt till spring comes round again. This is just what the frogs and newts and other animal inhabitants of the pond do at the same time, to prevent getting frozen. Next year the severed tops send out roots in the soft mud of the bottom, and grow up afresh into new green pondweeds.

It is therefore impossible to make any broad line of distinction in this way between what may be considered as modes of individual persistence in the self-same plants, and what may be regarded as modes of reproduction by subdivision. Some plants, like couch-grass and elm, are almost always surrounded by young shoots which may ultimately become to all intents and purposes independent individuals; while others, like corn-poppy or Scotch fir, never produce any offsets or suckers. In the meadow orchids each plant produces every summer a second tuber by the side of the old one; and from the top of this tuber the next year's stem arises in due time with its spike of flowers. Here we may fairly regard the tuber as a simple means of persistence in the plant itself; there is nothing we could possibly call reproduction. But in many lilies the older bulbs produce numerous small branch bulbs at their sides; and these younger bulbs may become practically independent, each of them sending up in the course of time its own stem and its own spike of flowers.

Even when the main trunk of a tree is dead, through sheer old age, it often happens, as in the elm and birch, that the roots send up fresh young shoots, which may grow again, and prolong the life of the plant indefinitely. In stone-crops and other succulent herbs, which grow in very dry and desert situations, the merest fragment of a stem, dropped on moist soil, will send out roots and grow afresh into a new individual. Cactuses and other desert plants have often to resist immense drought, and therefore possess extraordinary vitality in this way. They will grow again from the merest cut end under favourable conditions.

These few short hints as to the life-history of various plants in different circumstances will serve to show you how vast is their variety. Every plant, indeed, has endless ways and tricks of its own; and every point in its structure, however unobtrusive, has some purpose to serve in its domestic economy. Thus the ivy-leaved toad-flax, which grows on dry walls, has straight flower-stalks, which become bent or curved when the flowering is over. Why is this? Well, the plant has acquired the habit of bending round its flower-stalk after the blossoming season, because it cannot sow its seeds on the bare stone, so it hunts about diligently for a crevice among the mortar into which it proceeds to insert its capsule, so that the seedlings may start fair in a fit and proper place for their due germination. So, too, the subterranean clover, growing on close-cropped hillocks much nibbled over by sheep, where its pods of rich seeds would be certainly devoured if exposed on a long stalk like that of other clovers, has developed a few abortive corkscrew-like blossoms in the centre of its flower-head, by whose aid the whole group of pods burrows its way spirally into the soil beneath; so that the plant thus at once escapes its herbivorous enemies, and sows its own seed for itself automatically. It would be impossible in our space to do more than thus briefly indicate by two or three examples the immense number and variety of these special adaptations. Every plant has hundreds of them. There is not a tiny hair on the surface of a flower, not a spot or a streak in the blade of a leaf, not a pit or depression on the skin of a seed, that has not its function. And close study of nature rewards us most of all for our trouble in this, that it reveals to us every day some delightful surprise, forces on our attention some hitherto unsuspected but romantic relation of structure and purpose.

I will mention but one more case as a typical example. There exists as a rule a definite relation between the shape and arrangement of the leaves in plants, and the shape and arrangement of the roots and rootlets, with regard to water-supply. Each plant, in point of fact, is like the roof of a house as respects the amount of rain which it catches and drains away; and it is important for each that it should utilise to the utmost its own particular supply of drainage or rain water. Hence you will find that some plants, like the dock, have large channeled leaves, with a leaf-stalk traversed by a depression like a drainage runnel: plants of this type carry off all the water that falls upon them towards the centre, inwards. But such plants have always also a descending tap-root, which instantly catches and drinks up the water poured by the drainage system of the leaves towards the middle of the plant. In other plants, again, however, with round leaf-stalks and outward pointed leaves, the water that falls upon the foliage drains outward towards the circumference; and in all such plants the roots, instead of descending straight down, are spread ing and diffused, so as to go outward towards the point where the water drips on them. Moreover, in this latter case it is found, on digging up the plant carefully, that the absorbent tips of the rootlets are clustered thickest about the exact spots where the leaves habitually drop the water down upon them. Every plant is thus to some extent a catchment-basin which utilises its own rainfall: it collects rain for itself, and conducts it by a definite system of pipes and channels to the precise spots in the soil where it can best be sucked up for the plant's own purposes.

On the other hand, while every part of every plant is thus minutely arranged for the common advantage, every species of plant and animal fights only for its own hand against all comers. Nature is therefore one vast theatre of plot and counterplot. The parasites prey on the vegetative kinds; the vegetative kinds respond in turn by developing checks to counteract the parasites. The squirrels produce sharper and ever sharper teeth to gnaw through the nutshells; the nut-trees retaliate by producing for their part thicker and ever thicker shells to baffle the squirrels. And this play and by-play goes on unceasingly from generation to generation; because only the cleverest squirrels can ever get enough nuts to live upon; and only the hardest-shelled and bitterest-rinded nuts can escape the continual assaults of the squirrels. In order, therefore, really to understand the structure and life of any one species, we should have to know in the minutest detail all about its native conditions, its soil, its surroundings, its allies, its hire friends, its blackmailing foes, its exterminatin enemies. Such exhaustive knowledge of th tiniest weed is clearly impossible; but even th little episodes we can pick out piecemeal are ful of romance, of charm, and of novelty.

CHAPTER XIV.

THE PAST HISTORY OF PLANTS.

I PROMISED some time since to return in du season to the question why plants, as a rule exhibit distinct kinds or *species*, instead o merging gradually one into another by imperceptible degrees. This problem is generally known as the problem of *the origin of species* You might perhaps expect (since plants have grown and developed, as we have seen, one ou of the other) that they would consist at present o an unbroken series, each melting into each, from the highest to the lowest. This, however, is not really the case; they form on the contrary groups of distinct *kinds:* and the reason is, tha natural selection acts on the whole in the opposite direction. It tends to make plants group themselves into definite bodies or species, al alike within the body, and well marked off from all others outside it.

Here is the way this arrangement comes about. As situations and circumstances vary a form is at last arrived at in each situation which approximately fits the particular circum stances. This form may perhaps vary again in other situations, and give rise to individuals better adapted to the second set of circumstances. But just in proportion as such individuals surpass in adaptation one another will they live down the less adapted. Hence, the intermediate forms will tend to perish, and the world to be filled in the end with groups of plants, each distinct from others, and each relatively fixed and similar within its own limits.

At all times, and in all places, this process of *variation* and *adaptation* is continually going on; new kinds are being formed, and intermediates are dying out between them. For the intermediates are necessarily less adapted than the older form to the old conditions, and than the newer form to the new ones.

Moreover, when any great point of advantage is once gained by a kind, it tends to go on and be preserved, while variations in other parts continue uninterrupted. Thus, the first composite plant (to take a concrete example) gained by the massing of its flowers into a compact head: and it then became a starting-point for fresh developments, each of which maintained the massed flower-head, with its ring of united stamens, while adding to the type some fresh point of its own, which specially adapted it to a particular situation. So, too, the first peaflower gained by the peculiar form of its oddly-shaped corolla, and therefore became the ancestor of many separate kinds, each of which retains the general pea-like type of blossom, while differing of that progenitor's peculiarities while differing much in other respects among themselves, is called a *family*. Thus we speak of the family of the peaflowers, the family of the roses, the family of the lilies, the family of the orchids. Each family may include several minor groups, known as *genera* (in the singular, *a genus*); and each such genus may further include several distinct kinds or *species*.

For example, all the peaflower *family* are distinguished by their possession of a peculiar blossom whose corolla consists of a standard, a keel, and two wings, like sweet-pea or broom. This family contains several *genera*, one of which is that of the clovers, including certain peaflowers which have learned to mass their blossoms into a roundish head, and have trefoil leaves, and very few seeds in the short seed-pod. The clovers, again, are subdivided into *species* or kinds, such as purple clover, Dutch clover, hop clover, and hare's foot clover; in Britain alone, we have twenty-one such distinct species or kinds of clover. You will see at once that this method of grouping by ancestral forms enables us largely to reconstruct the history of each particular plant or animal.

Why don't these kinds cross freely with one another, and so produce an endless set of puzzling hybrids? Well, they do occasionally;

and such mongrel forms often show us every possible variation between the two parents. But this can only happen when the parent stocks are very close to one another; and even then, the hybrids tend to die out rapidly. Why? Because each of the parents is better adapted to a particular situation; the hybrid usually falls between two stools, and gets killed down accordingly. It cannot stand the competition of the true species. New kinds, however, may sometimes take their rise from chance hybrids, which happen to possess some combination of advantages.

Thus plants in the mass, as we see them around us at the present day, are divisible into several well-marked groups, some of which are now dominant or leading orders, while others are hardly more than mere belated stragglers or loitering representatives of types once common, but now outstripped in the race by younger competitors. I cannot close without briefly describing to you the main divisions of such orders or groups, as now accepted by modern botanists.

The widest distinction of all between plants is that which marks off the simpler and earlier forms, which are wholly composed of cells, from the higher and stem-forming types, which are also provided with systems of vessels and woody tissue. The first class is known as CELLULAR PLANTS; the second class as VASCULAR PLANTS. These are the greatest and most general divisions.

The CELLULAR PLANTS comprise many sorts, from the simple one-celled types which float freely in water, up to the relatively high and complex seaweeds, which produce large fleshy fronds, and often display a considerable division of labour between their various parts and organs. Still, as most of them live in water, either fresh or salt, and wave freely about in the liquid that surrounds them, they have no need of an elaborate system of conducting vessels, because every part can drink in water and dissolved food-salts from the neighbouring pond, sea, or river. Still less have they any necessity for a woody stem, which would only be a disadvantage to them in stormy weather. Hence most of the *cellular plants* (with certain exceptions to be noted hereafter) are water-weeds; while most of the vascular plants (with other exceptions to be similarly treated) are land plants. In particular trees and shrubs, the highest forms of plant life, are invariably terrestrial.

Various successive stages of these cellular plants may be briefly described in rough outline. First of all we get the simple one-celled plant, the lowest type of all, consisting of a single mass of protoplasm, generally with chlorophyll, surrounded by a cell-wall. Next above these come the hair-like water-weeds, which consist of rows of such simple cells, placed end to end in single file, one in front of another, like pearls in a necklace. These kinds are many-celled, but each cell is here in contact with two others only, one below, and one above it. Thirdly, we get the flat leaf-like water-weeds, which have thin green fronds, composed of a single broad sheet of cells, not a hair-like row; each cell has here many cells around it, but all lie in one plane; the sheet is only one cell thick; it does not spread abroad in more than two directions. Lastly, we get the ordinary thick-fronded seaweed, in which sheets of cells, many layers deep, grow in divided masses on rope-like bases, and closely resemble to the eye true vascular plants with stems, leaves, and branches.

Most of these cellular plants, when they possess green chlorophyll, are known as *algæ.*

There are several low forms of plants, however, which do not possess chlorophyll, but live at the expense of other plants, exactly as animals do. These are generally known in the lump as *fungi.* Many of them are terrestrial. The distinction, however, is not a genealogical one. Cellular plants of various grades have often taken, time after time, to this lower parasitic or carrion-eating habit; and though they therefore resemble one another externally in their absence of green colour, in their usual whiteness and fleshiness, and in their mushroom-like substance, they do not really form a natural class; their resemblance is due to their habits only. In short, we call any cellular plant a *fungus*, if instead of supporting itself by green cells, it has adopted the trick of living on organised material already laid up by other plants or animals.

Among these fungus-like plants, again, some of the simplest and lowest are the celebrated *bacteria*, which are one-celled organisms, living in stagnant or putrid fluids, and also in the bodies and blood of diseased animals. They answer among *fungi* to the one-celled *algæ*. Many of them cause infectious diseases; such are the *bacilli* of diphtheria, typhus, cholera, consumption, small-pox, and influenza. Surrounded by a suitable nutritious fluid, these tiny parasitic plants increase with extraordinary and fatal rapidity. Though they are really one-celled, and reproduce by cell-division, they often hang together in rude lumps or clusters which simulate to some extent the many-celled bodies. In this book, however, where we have concentrated our attention mainly on the true or green plants, I have not thought it well to dwell at any length on the habits or structure of these animal-like organisms.

Another well-known group of small fungus-like plants is that which contains the yeast-fungus, a one-celled plant, which reproduces by budding.

The higher fungi are many-celled, and often possess well-marked organs for different purposes. They answer rather to the seaweeds and higher *algæ*. Familiar examples are the common moulds, which form on jam, dead fruit, and other decaying material. Some of them, like the smut of wheat and oats, are parasitic on growing plants, and most dangerous enemies to green vegetation. The highest fungi are the groups which include the mushroom, the puff-ball, and all those other large and curiously-shaped forms commonly lumped together in popular language under the name of toadstools. Their anatomy and physiology is extremely complex.

To recapitulate; CELLULAR PLANTS belong to two main types; those which *contain chlorophyll*, and live like plants by eating and assimilating carbon under the influence of sunshine; these are generally grouped together in a rough class as ALGÆ: and those which *contain no chlorophyll*, but live, like animals, by using up or destroying the carbon-compounds already stored up by green plants; these are generally grouped together in a rough class as FUNGI.

The lichens form a curious mixed group, whose strange habits cannot here be described at any adequate length; they are not so much separate plants as united colonies of algæ and fungi, in which the green alga does the main work of collecting food, while the parasitic fungus, increasing with it at the same rate, eats it up in part, while contributing in turn in various ways to the general good of the compound community. This is therefore hardly a case of pure destructive parasitism, but rather one of a co-operative society banded together on purpose for mutual advantage.

The mosses and liverworts, once more, show us an intermediate stage between the true cellular and the true vascular plants. They have a rudimentary stem, and beginnings of vessels. They have also leaves, or organs equivalent to them; and they display the first approach to something like flowers.

The VASCULAR PLANTS, again, which are characterised by the possession of special vessels for the conveyance of sap and organised material, and by the presence of more or less woody fibres, are divisible into two main groups—the *flowerless*, and the *flowering*.

The *flowerless* group of Vascular Plants are mainly represented by the ferns and horsetails. These were at one time the leading vegetation of the entire world, far outnumbering in kinds all the rest put together. But they have now been lived down by the flowering plants, which at present compose the main mass of the plant aristocracy.

The *flowering plants*, once more, fall into two main groups; the small but widespread group of *naked-seeded plants*, including the cycads, pines, firs, cypresses, and yews; and the very large group of *fruit-bearing plants*, including almost all the kinds of herb, shrub, bush, or tree familiarly known to you, as well as almost all those various plants with which we have busied ourselves in this little volume. You will thus see that the vast majority of species in the vegetable kingdom belong to small and relatively inconspicuous orders. Indeed, for the most part, we habitually disregard the cellular plants, thinking only of the vascular; while among the vascular themselves, again, we disregard the flowerless, thinking only of the flowering; and among the flowering kinds, we concentrate our attention as a rule on the fruit-producing group (in the botanical sense of the word) and neglect the naked-seeded. In short, we usually confine our attention to the highest division of the highest group of the highest half of the vegetable kingdom. The rest are for us mere inconspicuous mosses, moulds, or seaweeds.

The fruit-producing group of flowering plants are finally divided into the *dicotyledons* and the *monocotyledons*, whose chief differences I have already pointed out to you. And to complete our picture of this infinite hierarchy, the dicotyledons, once more, are divided into various families, such as the buttercups, the roses, the crucifers, the composites, the labiates, the umbellates, the saxifrages, and the catkin-bearers. The buttercup family, in particular (to select a single group), is further divisible into genera, such as buttercup, marsh marigold, larkspur, anemone, clematis, and aconite; while the buttercup genus (to take one only among these) comprises in turn a vast number of species, such as the water-crowfoot, the ivy-leaved crowfoot, the meadow buttercup, the bulbous buttercup, the lesser celandine, the goldilocks, and so on for pages. Similarly, the monocotyledons are divided into various families, such as the orchids, lilies, grasses, and sedges: the families are divided into many genera; and each genus into several species. The infinite variety of circumstances is such that each type goes on varying and varying for ever in order to fit itself for the endless situations it is called upon to fill, and the endless diversity in the accidents of climate or soil or position that it may chance to come across. Thus we have in England more than a hundred different kinds of grasses, each specially adapted for some one particular situation.

Only the closest individual study can give any adequate idea of this immense diversity of plants in nature.

The *geological history* of the world shows us that the development of plants has been slow and progressive. In the earliest rocks (of which an account is given in another volume of this series), we get few traces of any plants but the lowest: so that at that time it is probable none but seaweeds and their like existed—cellular plants which contain hardly any parts solid enough for preservation. By the age when the coal was laid down, however, ferns, horsetails, and many gigantic extinct plants with solid stems had begun to exist; but few or no flowering plants, except conifers, had yet been developed. Later still came the true flowering plants, with covered seeds, at first in simple and antiquated forms, but becoming more complex as birds, mammals, and flying insects of the flower-haunting types were developed side by side with them to visit and fertilise them or to disperse their seeds. Succulent fruits, of course, could only arise when tribes of fruit-eaters had been evolved to assist them; while such special bee-fertilised types as the sage group, and such complex forms as the orchids and composites, requiring the aid of highly-developed insects, are of extremely recent evolution. Plant and animal life have continually reacted upon one another.

Whoever has been interested in the study of plants by this little book may be glad to know what is the best way of continuing his acquaintance with the subject in future. Nothing gives one such a grasp of the facts of botany and of life in general as careful study of the plants which grow in one's own country. Students in the British Isles should therefore buy a copy of Bentham and Hooker's *British Flora,* and seek by the aid of the key at its beginning to identify for themselves every flowering plant they come across in our woods and meadows. American students should get in like manner Asa Gray's *Manual of Botany.* In the course of identifying all the plants you find, you will begin to understand the nature of plant life and the course of plant evolution in a way that is quite impossible through any mere book-reading. Buy also a simple platyscopic lens, and a sharp penknife to assist you in dissection. Armed with these simple but useful tools, you will soon make rapid and solid progress in the knowledge of nature.

For further and more detailed information on the laws of plant life, you cannot do better than consult Kerner and Oliver's *Natural History of Plants,* which sets forth in full an immense number of interesting and curious facts, in language comprehensible to any attentive and careful student.

Although the conspiracy against which he was fighting was condemned by the pope, it had grown nevertheless too evidently out of the contest with Becket, which had ended so terribly. The combination of his wife and sons with his other enemies was something off the course of nature—strange, dark, and horrible. He was abler than most of his contemporaries, but his piety was (as with most wise men) a check upon his intellect. He, it is clear, did not share in the suspicion that the miracles at the archbishop's tomb were the work either of fraud or enchantment. He was not a person who for political reasons would affect emotions which he despised. He had been Becket's friend. Becket had been killed, in part at least, through Henry's fault; and, though he might still believe himself to have been essentially right in the quarrel, the miracles showed that the archbishop had been really a saint. A more complete expiation than the pope had enjoined might be necessary before the avenging spirit, too manifestly at work, could be pacified.

From Southampton he directed his way to Canterbury, where the bishops had been ordered to meet him. He presented offerings at the various churches which he passed on his way. On reaching Harbledown, outside the city, he alighted at the hair penitential shirt, over which a coarse pilgrim's cloak was thrown; and in this costume, with bare and soon bleeding feet, Henry, King of England, Lord of Ireland, Duke of Normandy, and Count of Anjou, walked through the streets to the cathedral. Pausing at the spot where the archbishop had fallen, and kissing the stone, he descended into the crypt to the tomb, burst into tears, and flung himself on the ground. There surrounded by a group of bishops, knights, and monks, he remained long upon his knees in silent prayer. The Bishop of London said for him, what he had said himself at Avranches, that he had not commanded the murder, but had occasioned it by his hasty words. When the bishop ended, Henry rose, and repeated his confession with his own lips. He had caused the archbishop's death; therefore he had come in person to acknowledge his sin, and to entreat the brothers of the monastery to pray for him.

At the tomb he offered rich silks and wedges of gold. To the chapter he gave lands. For himself

---

[1] July 12.

he vowed to erect and endow a religious house, which should be dedicated to St. Thomas. Thus amply, in the opinion of the monks, *reconciliari meruit,* he deserved to be forgiven. But the satisfaction was still incomplete. The martyr's injuries, he said, must be avenged on his own person. He threw off his cloak, knelt again, and laid his head upon the tomb. Each bishop and abbot present struck him five times with a whip. Each one of the eighty monks struck him thrice. Strange scene! None can be found more characteristic of the age; none more characteristic of Henry Plantagenet.

The penance done, he rose and resumed his cloak; and there by the tomb through the remainder of the July day, and through the night till morning, he remained silently sitting, without food or sleep. The cathedral doors were left open by his orders. The people of the city came freely to gape and stare at the singular spectacle. There was the terrible King Henry, who had sent the knights to kill their archbishop, sitting now in dust and ashes. The most ingenious cunning could not have devised a better method of winning back the affection of his subjects; yet with no act of king or statesman had ingenious cunning ever less to do. In the morning he heard mass, and presented offerings at the various altars. Then he became king once more, and rode to London to prepare for the invader. If his humiliation was an act of vain superstition, Providence encouraged him in his weakness. On the day which followed it William the Lion was defeated and made prisoner at Alnwick. A week later came news that the army at Gravelines had dissolved, and that the invasion was abandoned. Delivered from peril at home, Henry flew back to France and flung Lewis back over his own frontier. St. Thomas was now supposed to be fighting for King Henry. Imagination becomes reality when it gives to one party certainty of victory, to the other the anticipation of defeat. By the spring of 1175 the great combination was dissolved. The princes returned to their duty; the English and Norman rebels to their allegiance; and with Alexander's mediation Henry and Lewis and the Count of Flanders were for a time once more reconciled.

Though the formal canonization of Becket could not be accomplished with the speed which his impatient friends demanded, it was declared with the least delay which the necessary forms required. A commission which was sent from Rome to inquire into the authenticity of the miracles having reported satisfactorily, the promotion of the archbishop was immediately decreed, and the monks were able to pray to him without fear of possible irregularity. Due honour having been thus paid to the Church's champion, it became possible to take up again the ever-pressing problem of the Church's reform.

Between the pope and the king there had never really been much difference of opinion. They were now able to work harmoniously together. A successor for Becket at Canterbury was found in the Prior of Dover, for whose good sense we have a sufficient guarantee in the abhorrence with which he was regarded by the ardent champions of Church supremacy. The reformation was commenced in Normandy. After the ceremony at Avranches the cardinals who had come from Rome to receive Henry's confession held a council there. The resolutions arrived at show that the picture of the condition of the clergy left to us by Nigellus is not really overdrawn. It was decided that children were to be no more admitted to the cure of souls—a sufficient proof that children had been so admitted. It was decided that the sons of priests should not succeed to their father's preferments—an evidence not only of the habits of the incumbents, but of the tendency of Church benefices to become hereditary.

Yet more significantly the guilty bargains were forbidden by which benefices were let out to farm, and lay patrons presented incumbents on condition of sharing the offertory money; while pluralist ecclesiastics, of whom Becket himself had been a conspicuous instance, were ordered to give a third, at least, of their tithes to the vicars. At the close of the war, in 1175, a similar council was held at Westminster under the new primate. Not only the Avranches resolutions were adopted there, but indications appeared that among the English clergy simony and licence were at a yet grosser point than on the Continent. Benefices had been publicly set up to sale. The religious houses received money for the admission of monks and nuns. Priests, and even bishops, had demanded fees for administration of the sacraments; while as regarded manners and morals, it was evident that the priestly character sat lightly on the secular clergy. They carried arms; they wore their hair long like laymen; they frequented taverns and more questionable places; the more reputable among them were sheriffs and magistrates. So far as decrees of a council could alter the inveterate habits of the order, a better state of things was attempted to be instituted. In the October following, Cardinal Hugezun came from for which Henry pleaded seem at that time to have been partially recognized. Gross offenders were degraded by their ordinaries and passed over to the secular judges. For one particular class of offences definite statutory powers were conceded to the State. The clergy were notorious violators of the forest laws. Deer-stealing implied a readiness to commit other crimes, and Cardinal Hugezun formally consented that orders should be no protection in such cases. The betrayal of their interests on a matter which touched so nearly the occupation of their lives was received by the clergy with a scream of indignation. Their language on the occasion is an illustration of what may have been observed often, before and since, that no order of men are less respectful to spiritual authority when they disapprove its decrees.

'The aforesaid cardinal,' wrote Benedict and Walter of Coventry, 'conceded to the king the right of impleading the clerks of his realm under the forest laws, and of punishing them for taking deer. Limb of Satan that he was! mercenary satellite of the devil himself! Of a shepherd he was made a robber. Seeing the wolf coming, he fled away and have spared their passion. The laws of any country cannot be maintained above the level of the average intelligence of the people; and in another generation the clergy would be free to carry their cross-bows without danger of worse consequences than a broken crown from the staff of a gamekeeper. 'Archbishop Richard,' says Giraldus, 'basely surrendered the rights which the martyr Thomas had fought for and won, but Archbishop Stephen recovered them.' The blood of St. Thomas had not been shed, and the martyr of Canterbury had not been allowed a monopoly of wonder-working, that a priest should be forbidden to help himself to a haunch of venison on festival days. In the great Charter of English freedom the liberties of the Church were comprehended in the form, or almost in the form, in which Becket himself would have defined them. The barons paid for the support of the clergy on that memorable occasion by the concession of their most extravagant demands. Benefit of clergy thence-

---

[1] 'Ecce membrum Satanæ! ecce ipsius Satanæ conductus satelles! qui tam subito factus de pastore raptor videns lupum venientem fugit et dimisit oves sibi a summo pontifice commissas.'

forward was permitted to throw an enchanted shield not round deer-stealers only, but round thieves and murderers, and finally round every villain that could read. The spiritual courts, under the name of liberty, were allowed to develope a system of tyranny and corruption unparalleled in the administrative annals of any time or country. The English laity were for three centuries condemned to writhe under the yoke which their own credulous folly had imposed on them, till the spirit of Henry II. at length revived, and the aged iniquity was brought to judgment at the Reformation.

THE OXFORD COUNTER-REFORMATION.[1]

[GOOD WORDS. 1881.]

LETTER I.

THE CHURCH OF ENGLAND FIFTY YEARS AGO.

MY DEAR ——. You remind me of a promise which I have left too long unfulfilled. We had been looking over some of your old family papers, and we had found among them a copy of the once famous Tract 90, scored over with pencil marks and interjections. The rocket which had flamed across the sky was now a burnt-out case. It was hard to believe that the whole mind of England could have been so agitated by expressions and ideas which had since become so familiar. We were made to feel how times had changed in the last forty years; we had been travelling on a spiritual railroad, and the indifference with which we turned the leaves of the once-terrible pamphlet was an evidence how far we had left behind our old traditionary landmarks. Mysteries which had been dismissed as superstitions at the Reformation, and had never since been heard of, were now preached again by half the clergy, and had revolutionized the ritual in our churches. Every county had its Anglican monasteries and convents. Romanism had lifted up its head again. It had its hierarchy and its cardinals; it was a power in Parliament, and in the London salons. The fathers confessors were busy in our families, dictating conditions of marriages, dividing wives from husbands, and children from parents.

---

[1] These letters were originally published before the appearance of Mr. Mozley's *Reminiscences of the Oxford Movement.* I have not found it necessary to make any alterations.

By the side of the revival of Catholicism there was a corresponding phenomenon of an opposite and no less startling kind. Half a century ago any one who openly questioned the truth of Christianity was treated as a public offender and was excommunicated by society. Now, while one set of men were bringing back mediævalism, science and criticism were assailing with impunity the authority of the Bible; miracles were declared impossible; even Theism itself was treated as an open question, and subjects which in our fathers' time were approached only with the deepest reverence and solemnity were discussed among the present generation with as much freedom as the common problems of natural philosophy or politics.

Both these movements began within a short distance of one another, and were evidently connected. You asked me to write down what I could recollect about their origin, having had, as you supposed, some special opportunities of knowing their history. I hesitated, partly because it is not agreeable to go back over our own past mistakes, partly because I have ceased to feel particular interest in either of them. For myself, I am convinced that they are roads both of them which lead to the wrong place, and that it is better for us to occupy ourselves with realities than fret our minds about illusions. If the Church of Rome recovers power enough to be dangerous, it will be shattered upon the same rocks on which it was dashed three centuries ago. The Church of England may play at sacerdotalism and masquerade in mediæval garniture; the clergy may flatter one another with notions that they can bind and loose the souls of their fellow-Christians, and transform the substance of the sacramental elements by spells and gestures; but they will not at this time of day persuade intelligent men that the bishops in their ordination gave them really supernatural powers. Their celebrations and processions may amuse for a time by their novelty, but their pretensions deserve essentially no more respect than those of spirit-rappers, and the serious forces of the world go on upon their way no more affected by them than if they were shadows.

As little is it possible to hope much from the school of negative and scientific criticism. For what science can tell us of positive truth in special subjects we are infinitely thankful. In matters of religion it can say nothing, for it knows nothing. A surgeon may dissect a living body to discover what life consists in. The body is dead before he can reach the secret, and he can report only that the materials when he has taken them to pieces and examined them are merely dead matter. Critical philosophy is equally at a loss with Christianity. It may perhaps discover the doctrines of the creed in previously existing Eastern theologies. It may pretend to prove that the sacred records were composed as human narratives are composed; that the origin of many of them cannot be traced; that they are defective in authority; that the evidence is insufficient to justify a belief in the events which they relate. So far as philosophy can see, there may be nothing in the materials of Christianity which is necessarily and certainly supernatural. And yet Christianity exists, and has existed, and has been the most powerful spiritual force which has ever been felt among mankind.

If I tell the story which you ask of me, therefore, I must tell it without sympathy, either way, in these great movements. I cannot, like 'the sow that was washed,' return to wallow in repudiated superstition. If I am to be edified, on the other hand, I must know what is true in religion; and I do not care about negations. In this respect I am unfit for the task which you impose on me. It is, perhaps, however, occasionally well to take stock of our mental experience. The last forty or fifty years will be memorable hereafter in the history of English opinion. The number of those who recollect the beginnings of the Oxford revival is shrinking fast; and such of us as survive may usefully note down their personal recollections as a contribution, so far as it goes, to the general narrative. It is pleasant too to recall the figures of those who played the chief parts in the drama. If they had not been men of ability they could not have produced the revolution that was brought about by them. Their personal characters were singularly interesting. Two of them were distinctly men of real genius. My own brother was at starting the foremost of the party; the flame, therefore, naturally burnt hot in my own immediate environment. The phrases and formulas of Anglo-Catholicism had become household words in our family before I understood coherently what the stir and tumult was about.

We fancy that we are free agents. We are conscious of what we do; we are not conscious of the causes which make us do it; and therefore we imagine that the cause is in ourselves. The Oxford leaders believed that they were fighting against the spirit of the age. They were themselves most completely the creatures of their age. It was one of those periods when Conservative England had been seized with a passion for Reform. Parliament was to be reformed; the municipal institutions were to be reformed; there was to be an end of monopolies and privileges. The constitution was to be cut in pieces and boiled in the Benthamite caldron, from which it was to emerge in immortal youth. In a reformed State there needed a reformed Church. My brother and his friends abhorred Bentham and all his works. The Establishment in its existing state was too weak to do battle with the new enemy. Protestantism was the chrysalis of Liberalism. The Church, therefore, was to be unprotestantized. The Reformation, my brother said, was a bad setting of a broken limb.

My brother exaggerated the danger, and underestimated the strength which existing institutions and customs possess so long as they are left undisturbed. Before he and his friends undertook the process of reconstruction, the Church was perhaps in the healthiest condition which it had ever known. Of all the constituents of human society, an established religion is that which religious men themselves should most desire to be let alone, and which people in general when they are healthy-minded are most sensitive about allowing to be touched. It is the sanction of moral obligation. It gives authority to the commandments, creates a fear of doing wrong, and a sense of responsibility for doing it. To raise a doubt about a creed established by general acceptance is a direct injury to the general welfare. Discussion about it is out of place, for only bad men wish to question the rule of life which religion commands; and a creed or ritual is not a series of propositions or a set of outward observances of which the truth or fitness may be properly argued; it grows with the life of a race or nation; it takes shape as a living germ develops into an organic body; and as you do not ask of a tree, is it *true*, but is it *alive*, so with an established Church or system of belief you look to the work which it is doing. If it is teaching men to be brave and upright, and honest and just, if it is making them noble-minded, careless of their selfish interests, and loving only what is good, the truth of it is proved by evidence better than argument, and idle persons may properly be prohibited from raising unprofitable questions about it. Where there is life, truth is present not as in propositions, but as an active force, and that is all which practical men need desire.

Thus in stern and serious ages, the religion of every country has been under the charge of the law; and to deny it has been treated as a crime. When the law has become relaxed, public opinion takes its place, and, though offenders are no longer punished, society excommunicates them. If religion were matter of speculation, they would be let alone; but so long as it is a principle of conduct, the common sense of mankind refuses to allow it to be trifled with.

Public opinion was in this sense the guardian of Christianity in England sixty years ago. Orthodox dissent was permitted. Doubts about the essentials of the faith were not permitted. In the last century, in certain circles of society, scepticism had for a time always a reproach. The Church administration had been slovenly; but in the masses of the people the convictions which they had inherited were still present, and were blown into flame easily by the Methodist revival. The Establishment followed the example and grew energetic again. The French Revolution had frightened all classes out of advanced ways of thinking, and society in town and country was Tory in politics, and determined to allow no innovations upon the inherited faith. It was orthodox without being theological. Doctrinal problems were little thought of. Religion, as taught in the Church of England, meant moral obedience to the will of God. The speculative part of it was accepted because it was assumed to be true. The creeds were reverentially repeated; but the essential thing was practice. People went to church on Sunday to learn to be good, to hear the commandments repeated to them for the thousandth time, and to see them written in gilt letters over the communion-table. About the powers of the keys, the real presence, or the metaphysics of doctrine, no one was anxious, for no one thought about them. It was not worth while to waste time over questions which had no bearing on conduct, and could be satisfactorily disposed of only by sensible indifference.

As the laity were, so were the clergy. They were generally of superior culture, manners, and character. The pastor in the 'Excursion' is a favourable but not an exceptional specimen of a large class among them. Others were country gentlemen of the best kind, continually in contact with the people, but associating on equal terms with the squires and the aristocracy. The curate of the last century, who dined in the servants' hall and married the ladies'-maid, had long disappeared, if he had ever existed outside popular novels. Not a specimen of him could have been found in the island. The average English incumbent of fifty years ago was a man of private fortune, the younger brother of the landlord perhaps, and holding the family living; or it might be the landlord himself, his adowson being part of the estate. His professional duties were his services on Sunday, funerals and weddings on week-days, and visits when needed among the sick. In other respects he lived like his neighbours, distinguished from them only by a black coat and white neckcloth, and greater watchfulness over his words and actions. He farmed his own glebe; he kept horses; he shot and hunted moderately, and mixed in general society. He was generally a magistrate; he attended public meetings, and his education enabled him to take a leading part in county business. His wife and daughters looked after the poor, taught in the Sunday-school, and managed the penny clubs and clothing clubs. He himself was spoken of in the parish as 'the master' —the person who was responsible for keeping order there, and who knew how to keep it. The labourers and the farmers looked up to him. The 'family' in the great house could not look down upon him. If he was poor it was still his pride to bring up his sons as gentlemen; and economies were cheerfully submitted to at home to give them a start in life —at the university, or in the army or navy.

Our own household was a fair representative of the order. My father was rector of the parish. He was archdeacon, he was justice of the peace. He had a moderate fortune of his own, consisting chiefly in land, and he belonged, therefore, to the 'landed interest.' Most of the magistrates' work of the neighbourhood passed through his hands. If anything was amiss, it was his advice which was most sought after, and I remember his being called upon to lay a troublesome ghost. In his younger days he had been a hard rider across country. His children knew him as a continually busy, useful man of the world, a learned and cultivated antiquary, and an accomplished artist. My brothers and I were excellently educated, and were sent to school and college. Our spiritual lessons did not go beyond the Catechism. We were told that our business in life was to work and to make an honourable position for ourselves. About doctrine, Evangelical or Catholic, I do not think that in my early boyhood I ever heard a single word, in church or out of it. The institution had drifted into the condition of what I should call moral health. It did not instruct us in mysteries, it did not teach us to make religion a special object of our thoughts; it taught us to use religion as a light by which to see our way along the road of duty. Without the sun our eyes would be of no use to us; but if we look *at* the sun we are simply dazzled, and can see neither it nor anything else. It is precisely the same with theological speculations. If the beacon lamp is shining a man of healthy mind will not discuss the composition of the flame. Enough if it shows him how to steer and keep clear of shoals and breakers. To this conception of the thing we had practically arrived. Doctrinal controversies were sleeping. People went to church because they liked it, because they knew that they ought to go, and because it was the custom. They had received the Creeds from their fathers, and doubts about them had never crossed their minds. Christianity had wrought itself into the constitution of their natures. It was a necessary part of the existing order of the universe, as little to be debated about as the movements of the planets or the changes of the seasons.

Such the Church of England was in the country districts before the Tractarian movement. It was not perfect, but it was doing its work satisfactorily. It is easier to alter than to improve, and the beginning of change, like the beginning of strife, is like the letting out of water. Jupiter, in Lessing's fable, was invited to mend a fault in human nature. The fault was not denied, but Jupiter said that man was a piece of complicated machinery, and if he touched a part he might probably spoil the whole.

But a new era was upon us. The miraculous nineteenth century was coming of age, and all the world was to be remade. Widely as the improvers of their species differed as to the methods to be followed, they agreed in this, that improvement there was to be. The Radicals wanted to make an end of Toryism and antiquated ideas. Young Oxford discovered that if the Radicals were to be fought with successfully the old weapons would not answer, and something was wanted 'deeper and truer than satisfied the last century.' Our English-speaking forefathers in the last century it seems were poor creatures, yet they had contrived to achieve considerable success in most departments of human affairs. They founded empires; they invented steam engines; they produced a Chatham, a Clive, a Warren Hastings, a Washington, a Franklin, a Nelson—a longer list of illustrious names than there is need to mention. Their literature might not equal the Elizabethan, but it was noteworthy in its way. A period which had produced Pope and Swift, Sterne and Fielding, Johnson and Goldsmith, Hume and Gibbon, Butler and Berkeley, was not so entirely shallow. Men had fixed beliefs in those days. Over the pool of uncertainties in which our own generation is floundering there was then a crust of undisturbed conviction on which they could plant their feet and step out like men. Their thoughts, if not deep, were clear and precise; their actions were bold and strong. A good many years, perhaps a good many hundreds of years, will have to pass before as sound books will be written again, or deeds done with as much pith and mettle in them. 'The something deeper and truer' would be more easily desired than found, but the words well convey the inflation with which the Catholic revivalists were going to their work. Our age perhaps has a mistaken idea of its consequence. All its geese are swans, and every new enemy is a monster never before heard of. The 'Edinburgh Review' and Brougham, and Mackintosh and the Reform Ministry, and Low Church philosophy and the London University, were not so very terrible. But as the windmills were giants to the knight of La Mancha, so the Whigs of those days were to young Oxford apostles the forerunners of Antichrist. Infidelity was rushing in upon us. Achilles must rise from his tent, and put on his celestial armour. The Church must re-assert herself in majesty to smite and drive back the proud aggressive intellect.

The excitement was unnecessary. The sun was not extinguished because a cloud was over its face. Custom, tradition, conservative instinct, and natural reverence for the truth handed down to it, would have sufficed more than amply to meet such danger as then existed. In a little while 'The Edinburgh' became the most orthodox of journals, and Brougham an innocent apostle of natural theology. Liberalism let well alone would have subsided into its place.

But it was not so to be. Achilles was roused in his wrath; and the foe whom he was to destroy was roused in turn, and has not been destroyed. The two parties were the counterparts one of the other; each was possessed with the same conceit of superiority to their fathers and grandfathers; each in its way supposed that it had a mission to reconstruct society. The Radicals believed in the rights of man, the progress of the species, and intellectual emancipation. To them our ancestors were children, and the last-born generation were the ancient sages, for they had inherited the accumulated experience of all past time. Established institutions represented only ignorance. The older they were, the less fitted they were, from the nature of the case, for modern exigencies.

In talk of this kind there was one part sense and nine parts nonsense. The Oxford school confronted it with a position equally extravagant. In their opinion truth was to be found only in the earliest fathers of the Church; the nearer that we could reach back to them, the purer we should find the stream. The bottom of the mischief was the modern notion of liberty, the supposed right of men to think for themselves and act for themselves. Their business was to submit to authority, and the seat of authority was the Church. The false idea had made its appearance in England first under the Plantagenet kings, in the Constitutions of Clarendon, the mortmain and premunire statutes. It had produced the Reformation, it had produced Puritanism and regicide. It now threatened the destruction of all that good men ought to value. The last century had been blind; our own fathers had been blind; but the terrible reality could no longer be concealed. The arch-enemy was at the door. The Test Act was repealed. Civil disabilities were taken off Dissenters. Brougham had announced that henceforth no man was to suffer for his religious opinions. Irish bishoprics were being suppressed. Lord Grey had warned the bishops in England to set their houses in order, and was said to have declared in private that the Church was a mare's nest. Catholic emancipation was equally monstrous. Romanists, according to the theory as it then stood, might be Churchmen abroad, but they were Dissenters in England and Ireland. War was to be declared at once, war to the knife, against the promoters of these enormities. History was reconstructed for us. I had learnt, like other Protestant children, that the pope was Antichrist, and that Gregory VII. had been a special revelation of that being. I was now taught that Gregory VII. was a saint. I had been told to honour the Reformers. The Reformation became the great schism, Cranmer a traitor, and Latimer a vulgar ranter. Milton was a name of horror, and Charles I. was canonized and spoken of as the holy and blessed martyr St. Charles. I asked once whether the Church of England was able properly to create a saint. St. Charles was immediately pointed out to me. Similarly we were to admire the nonjurors, to speak of James III. instead of the Pretender; to look for Antichrist, not in the pope, but in Whigs and revolutionists and all their works. Henry of Exeter, so famous in those days, announced once in my hearing that the Court of Rome had regretted the Emancipation Act as a victory of latitudinarianism. I suppose he believed what he was saying.

Under the sad conditions of the modern world the Church of England was the rock of salvation. The Church, needing only to be purged of the elements of Protestantism which had stolen into her, could then, with her apostolic succession, her bishops, her priests, and her sacraments, rise up, and claim and exercise her lawful authority over all persons in all departments. She would have but to show herself in her proper majesty, as in the great days when she fought with kings and emperors and now, as then, the powers of darkness would spread their wings and fly away to their own place.

These were the views which we used to hear in our home-circle when the Tracts were first beginning. We had been bred, all of us, Tories of the old school. This was Toryism in ecclesiastical costume. My brother was young, gifted, brilliant, and enthusiastic. No man is ever good for much who has not been carried off his feet by enthusiasm between twenty and thirty; but it needs to be bridled and bitted, and my brother did not live to be taught the difference between fact and speculation. Taught it he would have been, if time had been allowed him. No one ever recognized facts more loyally than he when once he saw them. This I am sure of, that when the intricacies of the situation pressed upon him, when it became clear to him that if his conception of the Church, and of its rights and position, was true at all, it was not true of the Church of England in which he was born, and that he must renounce his theory as visionary or join another communion, he would not have 'minimised' the Roman doctrines that they might be more easy for him to swallow, or have explained away plain propositions till they meant anything or nothing. Whether he would have swallowed them or not I cannot say; I was not eighteen when he died, and I do not so much as form an opinion about it; but his course, whatever it was, would have been direct and straightforward; he was a man far more than a theologian; and if he had gone, he would have gone with his whole heart and conscience, unassisted by subtleties and nice distinctions. It is, however, at least equally possible that he would not have gone at all. He might have continued to believe that all authority was derived from God; that God would have His will obeyed in this world, and that the business of princes and ministers was to learn what that will was. But prophets have passed for something as well as priests in making God's will known; and Established Church priesthoods have not been generally on particularly good terms with prophets. The only occasion on which the two orders are said to have been in harmony was when the prophets prophesied lies, and the priests bore rule in their name.

The terminus, however, towards which he and his friends were moving had not come in sight in my brother's life-time. He went forward, hesitating at nothing, taking the fences as they came, passing lightly over them all, and sweeping his friends along with him. He had the contempt of an intellectual aristocrat for private judgment and the rights of a man. In common things a person was a fool who preferred his own judgment to that of an expert. Why, he asked, should it be wiser to follow private judgment in religion? As to rights, the right of wisdom was to rule, and the right of ignorance was to be ruled. But he belonged himself to the class whose business was to order rather than obey. If his own bishop had interfered with him, his theory of episcopal authority would have been found inapplicable in that particular instance.

So the work went on. The Church was not to be a witness only to religious truth; it was first to repent of its sins, disown its Protestantism, and expel the Calvinistic poison; then it was to control politics and govern all opinion. Murmurs arose from time to time among the disciples. If the Reformation was to be called an act of schism, were we not on the road back to Rome? Shrewd observers were heard to say that the laity would never allow the Church of England to get on stilts. The Church was grafted on upon the State, and the State would remain master, let Oxford say what it pleased. But the party of the movement were to grow and fulfil their destiny. They were to produce results of incalculable consequence, yet results exactly opposite to what they designed and anticipated. They were to tear up the fibres of custom by which the Establishment as they found it was maintaining its quiet influence. They were to raise discussions round its doctrines, which degraded accepted truths into debatable opinions. They were to alienate the conservative instincts of the country, fill the clergy once more with the conceit of a priesthood, and convert them into pilot fish for the Roman missionaries. Worst of all, by their attempts to identify Christianity with the Catholic system, they provoked doubts, in those whom they failed to persuade, about Christianity itself. But for the Oxford movement, scepticism might have continued a harmless speculation of a few philosophers. By their perverse alternative, either the Church or nothing, they forced honest men to say, Let it be nothing, then, rather than what we know to be a lie. A vague misgiving now saturates our popular literature; our lecture rooms and pulpits echo with it; and the Established religion, protected no longer from irreverent questions, is driven to battle for its existence among the common subjects of secular investigation. Truth will prevail in the end, and the trial, perhaps, must have come at one time or other. But it need not have come when it did. There might have been peace in our days, if Achilles had remained in his tent.

You shall have the story of it all in the following letters.

LETTER II.

THE TRACTARIANS.

MY DEAR ——. I have told you that the Tractarians' object, so far as they understood themselves, was to raise up the Church to resist the revolutionary tendency which they conceived to have set in with the Reform Bill; that the effect of their work was to break the back of the resisting power which the Church already possessed, and to feed the fire which they hoped to extinguish. I go on to explain in detail what I mean.

When I went into residence at Oxford my brother was no longer alive. He had been abroad almost entirely for three or four years before his death; and although the atmosphere at home was full of the new opinions, and I heard startling things from time to time on Transubstantiation and suchlike, he had little to do with my direct education. I had read at my own discretion in my father's library. My own small judgment had been satisfied by Newton that the Pope was the Man of Sin; and Davison, to whom I was sent for a correction, had not removed the impression. I knew the 'Fairy Queen' pretty well, and had understood who and what was meant by the False Duessa. I read Sharon Turner carefully, and also Gibbon, and had thus unconsciously been swallowing antidotes to Catholic doctrine. Of evangelical books properly so called I had seen nothing. Dissent in all its forms was a crime in our house. My father was too solid a man to be carried off his feet by the Oxford enthusiasm, but he was a High Churchman of the old school. The Church itself he regarded as part of the constitution; and the Prayer-book as an Act of Parliament which only folly or disloyalty could quarrel with. My brother's notion of the evangelical clergy in the Establishment must have been taken from some unfortunate specimens. He used to speak of them as 'fellows who turned up the whites of their eyes, and said *Lawd*.' We had no copy of the 'Pilgrim's Progress' in the house. I never read it till after I had grown up, and I am sorry that I did not make earlier acquaintance with it. Speculations about the Church and the sacraments went into my head, but never much into my heart; and I fancy, perhaps idly, that I might have escaped some trials and some misfortunes if my spiritual imagination had been allowed food which would have agreed with it.

In my first term at the university, the controversial fires were beginning to blaze, but not as yet hotly. The authorities had not taken the alarm, but there was much talk and excitement, and neither the education nor the discipline of the place was benefited by it. The attention of the heads and tutors was called off from their proper business. The serious undergraduates divided into parties, and the measure with which they estimated one another's abilities was not knowledge or industry, but the opinions which they severally held. The neo-Catholic youths thought themselves especially clever, and regarded Low Churchmen and Liberals as fools. It was unfortunate, for the state of Oxford was crying out for reform of a different kind. The scheme of teaching for the higher class of men was essentially good, perhaps as good as it could be made; incomparably better than the universal knowledge methods which have taken its place. But the idle or dull man had no education at all. His three or four years were spent in forgetting what he had learnt at school. The degree examination was got over by a *memoria technica*, and three months' cram with a private tutor. We did pretty much what we liked. There was much dissipation, and the whole manner of life was needlessly extravagant. We were turned loose at eighteen, pleasures tempting us on all sides, the expense of indulgence being the only obstacle; and the expense for the first year or two was kept out of sight by the eagerness of the tradesmen to give us credit. No dean or tutor ever volunteered to help our inexperience. The prices which we paid for everything were preposterous. The cost of living might have been reduced to half what it was if the college authorities would have supplied the students on the co-operative system. But they would take no trouble, and their own charges were on the same extravagant scale. The wretched novice was an object of general plunder till he had learnt how to take care of himself. I remember calculating that I could have lived at a boarding-house on contract, with every luxury which I had in college, at a reduction of fifty per cent. In all this there was room and to spare for reforming energy, and it may be said that the administration of the university was the immediate business of the leading members—a business, indeed a duty, much more immediate than the unprotestantizing of the Church of England. But there was no leisure, there was not even a visible desire to meddle with concerns so vulgar. Famous as the Tractarian leaders were to become, their names are not connected with a single effort to improve the teaching at Oxford or to mend its manners. Behind the larger conflict which they raised, that duty was left untouched for many years; it was taken up ultimately by the despised Liberals, who have not done it well, but have at least accomplished something, and have won the credit which was left imprudently within their reach.

The state of things which I found on coming up was, thus, not favourable to the proper work of the place. In general there was far too little intercourse between the elder and the younger men. The difference of age was not really very great, but they seldom met, except in lecture-rooms. If an undergraduate now and then breakfasted with his tutor, the undergraduate was shy, and the tutor was obliged to maintain by distance and dignity of manner the superiority which he might have forfeited if he allowed himself to be easy and natural. I myself, for my brother's sake, was in some degree an exception. I saw something from the first of the men of whom the world was talking. I might have seen more, but I did not make the most of my opportunities. I wished to be a disciple. I thought I was a disciple. But somehow I could never feel in my heart that what they were about was of the importance which it seemed to be, and I was little more than a curious and interested spectator.

Nor, with two exceptions, were the chiefs of the movement personally impressive to me. Isaac Williams I had known as a boy. He was an early friend of my brother's, and spent a vacation or two at my father's house before I went to school. His black brilliant eyes, his genial laugh, the skill and heartiness with which he threw himself into our childish amusements, the inexhaustible stock of stories with which he held us spell-bound for hours, had endeared him to every one of us; and at Oxford to dine now and then with four or five others in Williams's rooms was still one of the greatest pleasures which I had. He was serious, but never painfully so; and though his thoughts ran almost entirely in theological channels, they rose out of the soil of his own mind, pure and sparkling as the water from a mountain spring. He was a poet, too, and now and then could rise into airy sweeps of really high imagination. There is an image in the 'Baptistery' describing the relations between the actions of men here in this world and the eternity which lies before them, grander than the finest of Keble's, or even of Wordsworth's:

Ice-chained in its headlong tract
Have I seen a cataract,
All throughout a wintry noon,
Hanging in the silent moon;
All throughout a sunbright even,
Like the sapphire gate of Heaven;
Spray, and wave, and drippings frore,
For a hundred feet and more
Caught in air, there to remain
Bound in winter's crystal chain.
All above still silent sleeps,
While in the transparent deeps,
Far below the current creeps.
Thus, methought, men's actions here,
In their headlong full career,
Were passing into adamant;
Hopes and fears, love, hate, and want,
And the thoughts, like shining spray,
Which above their pathway play,
Standing in the eye of day,
In the changeless heavenly noon,
Things done here beneath the moon.

Fault may be found with the execution in this passage, but the conception is poetry of the very highest order. But Williams was of quiet, unobtrusive spirit. He had neither the confidence nor the commanding nature which could have formed or led a party. The triumvirs who became a national force, and gave its real character to the Oxford movement, were Keble, Pusey, and John Henry Newman.

Newman himself was the moving power; the two others were powers also, but of inferior mental strength. Without the third, they would have been known as men of genius and learning; but their personal influence would have been limited to and have ended with themselves. Of Pusey I knew but little, and need not do more than mention him. Of Keble I can only venture to say a few words.

He had left residence at the time I speak of, but the 'Christian Year' had made him famous. He was often in Oxford as Professor of Poetry, and I was allowed to see him. Cardinal Newman has alluded in his 'Apologia' to the reverence which was felt for Keble. He is now an acknowledged Saint of the English Church, admired and respected even by those who disagree with his theology. A college has been founded in commemoration of him which bears his name; and the 'Christian Year' itself has passed through more than a hundred editions, and is a household word in every family of the Anglican Episcopal communion, both at home and in America. It seems presumptuous to raise a doubt about the fitness of a recognition so marked and so universal. But the question is not of Keble's piety or genuineness of character. Both are established beyond the reach of cavil, and it would be absurd and ungracious to depreciate them. The intellectual and literary quality of his work, however, is a fair subject of criticism; and I am heretical enough to believe that, although the 'Christian Year' will always hold a high place in religious poetry, it owes its extraordinary popularity to temporary and accidental causes. Books which are immediately successful, are those which catch and reflect the passing tones of opinion—all-absorbing while they last, but from their nature subject to change. The mass of men know little of other times or other ways of thinking than their own. Their minds are formed by the conditions of the present hour. Their greatest man is he who for the moment expresses most completely their own sentiments, and represents human life to them from their own point of view. The point of view shifts, conditions alter, fashions succeed fashions, and opinions opinions; and having ourselves lost the clue, we read the writings which delighted our great-grandfathers with wonder at their taste. Each generation produces its own prophets, and great contemporary fame, except in a few extraordinary instances, is revenged by an undeserved completeness of neglect.

Very different in general is the reception of the works of true genius. A few persons appreciate them from the first. To the many they seem flavourless and colourless, deficient in all the qualities which for the moment are most admired. They pass unnoticed amidst the meteors by which they are surrounded and eclipsed. But the meteors pass and they remain, and are seen gradually to be no vanishing coruscations, but new fixed stars, sources of genuine light, shining serenely for ever in the intellectual sky. They link the ages one to another in a common humanity. Virgil and Horace lived nearly two thousand years ago, and belonged to a society of which the outward form and fashion have utterly perished. But Virgil and Horace do not grow old, because while society changes men continue, and we recognize in reading them that the same heart beat under the toga which we feel in our own breasts. In the Roman Empire, too, there were contemporary popularities; men who were worshipped as gods, whose lightest word was treasured as a precious jewel—on whose breath millions hung expectant, who had temples built in their honour, who in their day were a power in the world. These are gone, while Horace remains—gone, dwindled into shadows. They were men, perhaps, of real worth, though of less than their admirers supposed, and they are now laughed at and moralized over in were sold in five years than of 'Hamlet' in two hundred. Yet 'Hamlet' will last as long as the 'Iliad;' 'Pickwick,' delightful as it is to us, will be unreadable to our great-grandchildren. The most genial caricature ceases to interest when the thing caricatured has ceased to be.

I am not comparing the 'Christian Year' to Pickwick, but there are fashions in religion as there are fashions in other things. The Puritans would have found it in the savour of the mystic Babylon. We cannot tell what English thought will be on these subjects in another century, but we may know if we are modest that it will not be identical with ours. Keble has made himself a name in history which will not be forgotten, and he will be remembered always as a person of singular piety, of inflexible integrity, and entire indifference to what is called fame or worldly advantages. He possessed besides, in an exceptional degree, the gift of expressing himself in the musical form which is called poetical. It is a form into which human thought naturally throws itself when it becomes emotional. It is the only form adequate to the expression of high intellectual passions. However powerful the intellect, however generous the heart, this particular faculty can alone convey to others what is passing in them, or give to spiritual beauty a body which is beautiful also. The poetic faculty thus secures to those who have it the admiration of every person; but it is to be remembered also that if the highest things can alone be fitly spoken of in poetry, all poetry is not necessarily of the highest things; and if it can rise to the grandest subjects, it can lend its beauty also to the most commonplace. The prima donna wields the spell of an enchantress, though the words which she utters are nonsense; and poetry can make diamonds out of glass, and gold out of ordinary metal. Keble was a representative of the devout mind of England. Religion, as he grew to manhood, was becoming self-conscious. It was passing out of its normal and healthy condition as the authoritative teacher of obedience to the commandments, into active anxiety about the speculative doctrines on which its graces were held to depend. Here, as in all other directions, the mental activity of the age was making itself felt. The evangelical movement was one symptom of it. The revival of sacramentalism was another, and found a voice in Keble. But this is all. We look in vain to him for any insight into the complicated problems of

Prayer-book for his guide, he has provided us with a manual of religious sentiment corresponding to the Christian theory as taught by the Church of England Prayer-book, beautifully expressed in language which every one can understand and remember. High Churchmanship had been hitherto dry and formal; Keble carried into it the emotions of Evangelicalism, while he avoided angry collision with Evangelical opinions. Thus all parties could find much to admire in him, and little to suspect. English religious poetry was generally weak—was not, indeed, poetry at all. Here was something which in its kind was excellent; and every one who was really religious, or wished to be religious, or even outwardly and from habit professed himself and believed himself to be a Christian, found Keble's verses chime in his heart like church bells.

The 'Christian Year,' however, could be all this, and yet notwithstanding it could be poetry of a particular period, and not for all time. Human nature remains the same; but religion alters. Christianity has taken many forms. In the early Church it had the hues of a hundred heresies. It developed in the successive councils. It has been Roman, it has been Greek, it has been Anglican, Lutheran, Calvinist, Arminian. It has adjusted itself to national characteristics; it has grown with the growth of general knowledge. Keble himself, in his latest edition, is found keeping pace with the progress of the times, and announcing that the hand as well as the heart receives the mystic presence in the Eucharist. He began to write for Church people as they were sixty years ago. The Church of England has travelled far since 1820. The 'Highest' rector then alive would have gone into convulsions if his curate had spoken to him about 'celebrating' mass. The most advanced Biblical critic would have closed the Speaker's Commentary with dismay or indignation. Changed opinions will bring change of feelings, and fresh poets to set the feelings to music. The 'Christian Year' has reigned without a rival through two generations, but 'the rhymes' are not of the powerful sort which will 'outlive the Pyramids,' and the qualities which have given them their immediate influence will equally forbid their immortality.

The limitations of Keble's poetry were visible in a still higher degree in himself. He was not far-seeing, his mind moved in the groove of a single order of ideas. He could not place himself in the position of persons who disagreed with him, and thus he could never see the strong points of their arguments. Particular ways of thinking he dismissed as wicked, although in his summary condemnation he might be striking some of the ablest and most honest men in Europe. If he had not been Keble he would have been called (treason though it be to write the words) narrow-minded. Circumstances independent of himself could alone have raised him into a leader of a party. For the more delicate functions of such an office he was constitutionally unfit, and when appealed to for advice and assistance by disciples who were in difficulties his answers were beside the purpose. He could not give to others what he did not himself possess. Plato, in the Dialogue of the Io, describes an ingenious young Athenian searching desperately for some one who would teach him to be wise. Failing elsewhere he goes to the poets. Those, he thought, who could say such fine things in their verses would be able to tell him in prose what wisdom consisted in. Their conversation unfortunately proved as profitless as that of the philosophers; and the youth concluded that the poetry came from divine inspiration, and that when off the sacred tripod they were but common men. Disappointment could not chill the admiration which the inquirer would continue to feel for so venerable a teacher as Keble, but of practical light that would be useful to him he often gathered as little as the Athenian. Even as a poet Keble was subjective only. He had no variety of note, and nothing which was not in harmony with his own theological school had intellectual interest for him.

To his immediate friends he was genial, affectionate, and possibly instructive, but he had no faculty for winning the unconverted. If he was not bigoted he was intensely prejudiced. If you did not agree with him there was something morally wrong with you, and your 'natural man' was provoked into resistance. To speak habitually with authority does not necessarily indicate an absence of humility, but does not encourage the growth of that quality. If there had been no 'movement,' as it was called, if Keble had remained a quiet country clergyman, unconscious that he was a great man, and uncalled on to guide the opinions of his age, he would have commanded perhaps more enduring admiration. The knot of followers who specially attached themselves to him, show traces of his influence in a disposition not only to think the views which they hold sound in themselves, but to regard those who think differently as their intellectual inferiors. Keble was incapable of vanity in the vulgar sense. But there was a subtle self-sufficiency in him which has come out more distinctly in his school.

I remember an instance of Keble's narrowness extremely characteristic of him. A member of a family with which he had been intimate had adopted Liberal opinions in theology. Keble probably did not know what those opinions were, but regarded this person as an apostate who had sinned against light. He came to call one day when the erring brother happened to be at home; and learning that he was in the house, he refused to enter, and remained sitting in the porch. St. John is reported to have fled out of a bath at Ephesus on hearing that the heretic Cerinthus was under the roof. Keble, I presume, remembered the story, and acted like the apostle.

The inability to appreciate the force of arguments which he did not like saved him from Rome, but did not save him from Roman doctrine. It would, perhaps, have been better if he had left the Church of England, instead of remaining there to shelter behind his high authority a revolution in its teaching. The mass has crept back among us. with which we thought we had done for ever, and the honourable name of Protestant, once our proudest distinction, has been made over to the Church of Scotland and the Dissenters.

Far different from Keble, from my brother, from Dr. Pusey, from all the rest, was the true chief of the Catholic revival—John Henry Newman. Compared with him, they were all but as ciphers, and he the indicating number. The times I speak of are far distant; the actors and the stormy passions which bubbled round them are long dead and forgotten among new excitements. Newman, too, for many years had dropped silent, and disappeared from the world's eyes. He came out again in a conflict with a dear friend of mine, who, on my account partly (at least, in reviewing a book which I had written), provoked a contest with him, and *impar congressus Achilli* seemed to have been foiled. Charles Kingsley is gone from us. English readers know now what he was, and from me or from any one he needs no further panegyric. In that one instance he conducted his case unskilfully. He was wrong in his estimate of the character of his antagonist, whose integrity was as unblemished as his own. But the last word has still to be spoken on the essential question which was at issue between them.

own life and actions, and next of the Catholic cause. The writer of it is again a power in modern society; a prince of the Church; surrounded, if he appears in public, with adoring crowds, fine ladies going on their knees before him in London salons. Himself of most modest nature, he never sought greatness, but greatness found him in spite of himself. To him, if to any one man, the world owes the intellectual recovery of Romanism. Fifty years ago it was in England a dying creed, lingering in retirement in the halls and chapels of a few half-forgotten families. A shy Oxford student has come out on its behalf into the field of controversy, armed with the keenest weapons of modern learning and philosophy; and wins illustrious converts, and has kindled hopes that England herself, the England of Elizabeth and Cromwell, will kneel for absolution again before the father of Christendom. Mr. Buckle questioned whether any great work has ever been done in this world by an individual man. Newman, by the solitary force of his own mind, has produced this extraordinary change. What he has done we will see; what will come of it our children will see. Of the magnitude of the phenomenon itself no reasonable person can doubt. Two writers have affected powerfully the present generation of Englishmen. Newman is one, Thomas Carlyle is the other. But Carlyle has been at issue with all the tendencies of his age. Like a John the Baptist, he has stood alone preaching repentance in a world which is to him a wilderness. Newman has been the voice of the intellectual reaction of Europe, which was alarmed by an era of revolutions, and is looking for safety in the forsaken beliefs of the ages which it had been tempted to despise.

The 'Apologia' is the most beautiful of autobiographies, but it tells us only how the writer appeared to himself. We who were his contemporaries can alone say how he appeared to us in the old days at Oxford.

LETTER III.

JOHN HENRY NEWMAN.

My dear ——. My present letter will be given to a single figure. When I entered at Oxford, John Henry Newman was beginning to be famous. The responsible authorities were watching him with anxiety; clever men were looking with interest and curiosity on the apparition among them of one of those persons of indisputable genius who was likely to make a mark upon his time. His appearance was striking. He was above the middle height, slight and spare. His head was large, his face remarkably like that of Julius Cæsar. The forehead, the shape of the ears and nose, were almost the same. The lines of the mouth were very peculiar, and I should say exactly the same. I have often thought of the resemblance, and believed that it extended to the temperament. In both there was an original force of character which refused to be moulded by circumstances, which was to make its own way, and become a power in the world; a clearness of intellectual perception, a disdain for conventionalities, a temper imperious and wilful, but along with it a most attaching gentleness, sweetness, singleness of heart and purpose. Both were formed by nature to command others, both had the faculty of attracting to themselves the passionate devotion of their friends and followers, and in both cases, too, perhaps the devotion was rather due to the personal ascendency of the leader than to the cause which he represented. It was Cæsar, not the principle of the empire, which overthrew Pompey and the constitution. *Credo in Newmannum* was a common phrase at Oxford, and is still unconsciously the faith of nine-tenths of the English converts to Rome.

When I first saw him he had written his book upon the Arians. An accidental application had set him upon it, at a time, I believe, when he had half resolved to give himself to science and mathematics, and had so determined him into a theological career. He had published a volume or two of parochial sermons. A few short poems of his had also appeared in the 'British Magazine' under the signature of 'Delta,' which were reprinted in the 'Lyra Apostolica.' They were unlike any other religious poetry which was then extant. It was hard to say why they were so fascinating. They had none of the musical grace of the 'Christian Year.' They were not harmonious; the metre halted, the rhymes were irregular, yet there was something in them which seized the attention, and would not let it go. Keble's verses flowed in soft cadence over the mind, delightful, as sweet sounds are delightful, but are forgotten as the vibrations die away. Newman's had pierced into the heart and mind, and there remained. The literary critics of the day were puzzled. They saw that he was not an ordinary man; what sort of an extraordinary man he was they could not tell. 'The eye of Melpomene has been cast upon him,' said the omniscient (I think) 'Athenæum';[1] 'but the glance was not fixed or steady.' The eye of Melpomene had extremely little to do in the matter. Here were thoughts like no other man's thoughts, and emotions like no other man's emotions. Here was a man who really believed his creed, and let it follow him into all his observations upon outward things. He had been travelling in Greece; he had carried with him his recollections of Thucydides, and while his companions were sketching olive gardens and old castles and picturesque harbours at Corfu, Newman was recalling the scenes which those harbours had witnessed thousands of years ago in the civil wars which the Greek historian has made immortal. There was nothing in this that was unusual. Any one with a well-stored memory is affected by historical scenery. But Newman was oppressed with the sense that the men who had fallen in that desperate strife were still alive, as much as he and his friends were alive.

> Their spirits live in awful singleness,

he says,

> Each in its self-formed sphere of light or gloom.

---

[1] Perhaps it was not the *Athenæum*. I quote from memory. I remember the passage from the amusement which it gave me; but it was between forty and fifty years ago, and I have never seen it since.

We should all, perhaps, have acknowledged this in words. It is happy for us that we do not all realize what the words mean. The minds of most of us would break under the strain.

Other conventional beliefs, too, were quickened into startling realities. We had been hearing much in those days about the benevolence of the Supreme Being, and our corresponding obligation to charity and philanthropy. If the received creed was true, benevolence was by no means the only characteristic of that Being. What God loved we might love; but there were things which God did not love; accordingly we found Newman saying to us—

> Christian, would'st thou learn to love?
>   First learn thee how to hate.
>
> . . . . .
>
> Hatred of sin and zeal and fear
>   Lead up the Holy Hill;
> Track them, till charity appear
>   A self-denial still.

It was not austerity that made him speak so. No one was more essentially tender-hearted. But he took the usually accepted Christian account of man and his destiny to be literally true, and the terrible character of it weighed upon him.

> Sunt lacrymæ rerum et mentem mortalia tangunt.

He could be gentle enough in other moods. 'Lead, can here meet on common ground and join in a common prayer. Familiar as the lines are, they may here be written down once more:—

Lead, kindly Light, amid the encircling gloom
    Lead Thou me on.
The night is dark, and I am far from home,
    Lead Thou me on.
Keep Thou my feet; I do not ask to see
Far distant scenes—one step enough for me.

I was not ever thus, nor prayed that Thou
    Should'st lead me on.
I loved to choose and see my path; but now
    Lead Thou me on.
I loved the garish day, and, spite of fears,
Pride ruled my will. Remember not past years

So long Thy power hath blest us, sure it will
    Still lead us on,
O'er moor and fen, o'er crag and torrent, till
    The night is gone,
And with the morn those angel faces smile
Which I have loved long since, and lost awhile.

It has been said that men of letters are either much less or much greater than their writings. Cleverness and the skilful use of other people's thoughts produce works which take us in till we see the authors, and then we are disenchanted. A man of genius, on the other hand, is a spring in which there is always more behind than flows from it. The painting or the poem is but a part of him inadequately realized, and his nature expresses itself, with equal or fuller completeness, in his life, his conversation, and personal presence. This was eminently true of Newman. Greatly as his poetry had struck me, he was himself all that the poetry was, and something far beyond. I had then never seen so impressive a person. I met him now and then in private; I attended his church and heard him preach Sunday after Sunday; he is supposed to have been insidious, to have led his disciples on to conclusions to which he designed to bring them, while his purpose was carefully veiled. He was, on the contrary, the most transparent of men. He told us what he believed to be true. He did not know where it would carry him. No one who has ever risen to any great height in this world refuses to move till he knows where he is going. He is impelled in each step which he takes by a force within himself. He satisfies himself only that the step is a right one, and he leaves the rest to Providence. Newman's mind was world-wide. He was interested in everything which was going on in science, in politics, in literature. Nothing was too large for him, nothing too trivial, if it threw light upon the central question, what man really was, and what was his destiny. He was careless about his personal prospects. He had no ambition to make a career, or to rise to rank and power. Still less had pleasure any seductions for him. His natural temperament was bright and light; his senses, even the commonest, were exceptionally delicate. I was told that, though he rarely drank wine, he was trusted to choose the vintages for the college cellar. He could admire enthusiastically any greatness of action and character, however remote the sphere of it from his own. Gurwood's 'Dispatches of the Duke of Wellington' came out just then. Newman had been reading the book, and a friend asked him what he thought of it. 'Think?' he said, 'it makes one burn to have been a soldier.' But his own subject was the absorbing interest with him. Where Christianity is a real belief, where there are distinct convictions that a man's own self and the millions of human beings who are playing on the earth's surface are the objects of a supernatural dispensation, and are on the road to heaven or hell, the most powerful mind may well be startled at the aspect of things. If Christianity was true, since Christianity was true (for Newman at no time doubted the reality of the revelation), then modern

England, modern Europe, with its march of intellect and its useful knowledge and its material progress, was advancing with a light heart into ominous conditions. Keble had looked into no lines of thought but his own. Newman had read omnivorously; he had studied modern thought and modern life in all its forms, and with all its many-coloured passions. He knew, of course, that many men of learning and ability believed that Christianity was not a revelation at all, but had been thrown out, like other creeds, in the growth of the human mind. He knew that doubts of this kind were the inevitable results of free discussion and free toleration of differences of opinion; and he was too candid to attribute such doubts, as others did, to wickedness of heart. He could not, being what he was, acquiesce in the established religion as he would acquiesce in the law of the land, because it was there, and because the country had accepted it, and because good general reasons could be given for assuming it to be right. The soundest arguments, even the arguments of Bishop Butler himself, went no farther than to establish a probability. But religion with Newman was a personal thing between himself and his Maker, and it was not possible to feel love and devotion to a Being whose existence was merely probable. As Carlyle says of himself when in a similar condition, a religion which was not a certainty was a mockery and a horror; and unshaken and unshakable as his own convictions were, Newman evidently was early at a loss for the intellectual grounds on which the claims of Christianity to abstract belief could be based. The Protestant was satisfied with the Bible, the original text of which, and perhaps the English translation, he regarded as inspired. But the inspiration itself was an assumption, and had to be proved; and Newman, though he believed the inspiration, seems to have recognized earlier than most of his contemporaries that the Bible was not a single book, but a national literature, produced at intervals, during many hundred years, and under endless varieties of circumstances. Protestant and Catholic alike appealed to it, and they could not both be right. Yet if the differences between them were essential, there must be some authority capable of deciding between them. The Anglican Church had a special theology of its own, professing to be based on the Bible. Yet to suppose that each individual left to himself would gather out of the Bible, if able and conscientious, exactly these opinions and no others, was absurd and contrary to experience. There were the creeds; but on what authority did the creeds rest? On the four councils? or on other councils, and, if other, on which? Was it on the Church? and, if so, on what Church? The Church of the Fathers? or the Church still present and alive and speaking? If for living men, among whom new questions were perpetually rising, a Church which was also living could not be dispensed with, then what was that Church, and to what conclusions would such an admission lead us?

With us undergraduates Newman, of course, did not enter on such important questions, although they were in the air, and we talked about them among ourselves. He, when we met him, spoke to us about subjects of the day, of literature, of public persons and incidents, of everything which was generally interesting. He seemed always to be better informed on common topics of conversation than any one else who was present. He was never condescending with us, never didactic or authoritative; but what he said carried conviction along with it. When we were wrong he knew why we were wrong, and excused our mistakes to ourselves while he set us right. Perhaps his supreme merit as a talker was that he never tried to be witty or to say striking things. Ironical he could be, but not ill-natured. Not a malicious anecdote was ever heard from him.

Prosy he could not be. He was lightness itself—the lightness of elastic strength—and he was interesting because he never talked for talking's sake, but because he had something real to say.

Thus it was that we, who had never seen such another man, and to whom he appeared, perhaps, at special advantage in contrast with the normal college don, came to regard Newman with the affection of pupils (though pupils, strictly speaking, he had none) for an idolized master. The simplest word which dropped from him was treasured as if it had been an intellectual diamond. For hundreds of young men *Credo in Newmannum* was the genuine symbol of faith.

Personal admiration, of course, inclined us to look to him as a guide in matters of religion. No one who heard his sermons in those days can ever forget them. They were seldom directly theological. We had theology enough and to spare from the select preachers before the university. Newman, taking some Scripture character for a text, spoke to us about ourselves, our temptations, our experiences. His illustrations were inexhaustible. He seemed to be addressing the most secret consciousness of each of us—as the eyes of a portrait appear to look at every person in a room. He never exaggerated; he was never unreal. A sermon from him was a poem, formed on a distinct idea, fascinating by its subtlety, welcome—how welcome!—from its sincerity, interesting from its originality, even to those who were careless of religion; and to others who wished to be religious, but had found religion dry and wearisome, it was like the springing of a fountain out of the rock.

The hearts of men vibrate in answer to one another like the strings of musical instruments. These sermons were, I suppose, the records of Newman's own mental experience. They appear to me to be the outcome of continued meditation upon his fellow-creatures and their position in this world; their awful responsibilities; the mystery of their nature, strangely mixed of good and evil, of strength and weakness. A tone, not of fear, but of infinite pity runs through them all, and along with it a resolution to look facts in the face; not to fly to evasive generalities about infinite mercy and benevolence, but to examine what revelation really has added to our knowledge, either of what we are or of what lies before us. We were met on all sides with difficulties; for experience did not confirm, it rather contradicted, what revelation appeared distinctly to assert. I recollect a sermon from him—I think in the year 1839—I have never read it since; I may not now remember the exact words, but the impression left is ineffaceable. It was on the trials of faith, of which he gave different illustrations. He supposed, first, two children to be educated together, of similar temperament and under similar conditions, one of whom was baptized and the other unbaptized. He represented them as growing up equally amiable, equally upright, equally reverent and God-fearing, with no outward evidence that one was in a different spiritual condition from the other; yet we were required to believe, not only that their condition was totally different, but that one was a child of God, and his companion was not.

Again, he drew a sketch of the average men and women who made up society, whom we ourselves encountered in daily life, or were connected with, or read about in newspapers. They were neither special saints nor special sinners. Religious men had faults, and often serious ones. Men careless of religion were often amiable in private life—good husbands, good fathers, steady friends, in public honourable, brave, and patriotic. Even in the worst and wickedest, in a witch of Endor, there was a human heart and human tenderness. None seemed good enough for heaven, none so bad as to deserve to be consigned to the company of evil spirits, and to remain in pain and misery for ever. Yet all these people were, in fact, divided one from the other by an invisible line of separation. If they were to die on the spot as they actually were, some would be saved, the rest would be lost—the saved to have eternity of happiness, the lost to be with the devils in hell.

Again, I am not sure whether it was on the same occasion, but it was in following the same line of thought, Newman described closely some of the incidents of our Lord's passion; he then paused. For a few moments there was a breathless silence. Then, in a low, clear voice, of which the faintest vibration was audible in the farthest corner of St. Mary's, he said, 'Now, I bid you recollect that He to whom these things were done was Almighty God.' It was as if an electric stroke had gone through the church, as if every person present understood for the first time the meaning of what he had all his life been saying. I suppose it was an epoch in the mental history of more than one of my Oxford contemporaries.

Another sermon left its mark upon me. It was upon evidence. I had supposed up to that time that the chief events related in the Gospels were as well authenticated as any other facts of history. I had read Paley and Grotius at school, and their arguments had been completely satisfactory to me. The Gospels had been written by apostles or companions of apostles. There was sufficient evidence, in Paley's words, 'that many professing to be original witnesses of the Christian miracles had passed their lives in labours, dangers, and sufferings in attestation of the accounts which they delivered. St. Paul was a further and independent authority. It was not conceivable that such men as St. Paul and the other apostles evidently were should have conspired to impose a falsehood upon the world, and should have succeeded in doing it undetected in an age exceptionally cultivated and sceptical. Gibbon I had studied also, and had thought about the five causes by which he explained how Christianity came to be believed; but they had seemed to me totally inadequate. I was something more than surprised, therefore, when I heard Newman say that Hume's argument against the credibility of miracles was logically sound. The laws of nature, so far as could be observed, were uniform, and in any given instance it *was* more likely, as a mere matter of evidence, that men should deceive or be deceived, than that those laws should have been deviated from. Of course he did not leave the matter in this position. Hume goes on to say that he is speaking of evidence as addressed to the reason; the Christian religion addresses itself to faith, and the credibility of it is therefore unaffected by his objection. What Hume said in irony Newman accepted in earnest. Historically the proofs were insufficient, or sufficient only to create a sense of probability. Christianity was apprehended by a faculty essentially different. It was called faith. But what was faith, and on what did it rest? Was it as if mankind had been born with but four senses, by which to form their notions of things external to them, and that a fifth sense of sight was suddenly conferred on favoured individuals, which converted conjecture into certainty? I could not tell. For myself this way of putting the matter gave me no new sense at all, and only taught me to distrust my old ones.

I say at once that I think it was injudicious of Newman to throw out before us thus abruptly an opinion so extremely agitating. I explain it by supposing that here, as elsewhere, his sermons contained simply the workings of his own mind, and were a sort of public confession which he made as he went along. I suppose that something of this kind had been passing through him. He was in advance of his time. He had studied the early fathers; he had studied Church history, and the lives of the saints and martyrs. He knew that the hard and fast line which Protestants had drawn at which miracles had ceased was one which no historical canon could reasonably defend. Stories of the exercise of supernatural power ran steadily from the beginning to the latest period of the Church's existence; many of them were as well supported by evidence as the miracles of the New Testament; and if reason was to be the judge, no arbitrary separation of the age of the Apostles from the age of their successors was possible. Some of these stories might be inventions, or had no adequate authority for them; but for others there was authority of eye-witnesses; and if these were to be set aside by a peremptory act of will as unworthy of credit, the Gospel miracles themselves might fall before the same methods. The argument of Hume was already silently applied to the entire post-apostolic period. It had been checked by the traditionary reverence for the Bible. But this was not reason; it was faith. Perhaps, too, he saw that the alternative did not lie as sharply as Paley supposed, between authentic fact and deliberate fraud. Legends might grow; they grew every day, about common things and persons, without intention to deceive. Imagination, emotion, affection, or, on the other side, fear and animosity, are busy with the histories of men who have played a remarkable part in the world. Great historic figures—a William Tell, for instance—have probably had no historical existence at all, and yet are fastened indelibly into national traditions. Such reflections as these would make it evident that if the Christian miracles were to be believed, not as possibly or probably true, but as indisputably true—true in such a sense that a man's life on earth, and his hope for the future, could be securely based upon them—the history must be guaranteed by authority different in kind from the mere testimony to be gathered out of books. I suppose every thinking person would now acknowledge this to be true. And we see, in fact, that Christians of various persuasions supplement the evidence in several ways. Some assume the verbal inspiration of the Bible; others are conscious of personal experiences which make doubt impossible. Others, again, appeal justly to the existence of Christianity as a fact, and to the power which it has exerted in elevating and humanizing mankind. Newman found what he wanted in the living authority of the Church, in the existence of an organized body which had been instituted by our Lord Himself, and was still actively present among us as a living witness of the truth. Thus the imperfection of the outward evidence was itself an argument for the Catholic theory. All religious people were agreed that the facts of the Gospel narrative really happened as they were said to have happened. Proof there must be somewhere to justify the conviction; and proof could only be found in the admission that the Church, the organized Church with its bishops and priests, was not a human institution, but was the living body through which the Founder of Christianity Himself was speaking to us.

Such, evidently, was one use to which Hume's objection could be applied, and to those who, like Newman, were provided with the antidote, there was no danger in admitting the force of it. Nor would the risk have been great with his hearers if they had been playing with the question as a dialectical exercise. But he had made them feel and think seriously about it by his own intense earnestness, and brought up as most of them had been to believe that Christianity had sufficient historical evidence for it, to be suddenly told that the famous argument against miracles was logically valid after all, was at least startling. The Church theory, as making good a testimony otherwise defective, was new to most of us, and not very readily taken in. To remove the foundation of a belief, and to substitute another, is like putting new foundations to a house—the house itself may easily be overthrown in the process. I have said before that in a healthy state of things religion is considered too sacred to be argued about. It is believed as a matter of duty, and the why or the wherefore are not so much as thought about. Revolutions are not far off when men begin to ask whence the sovereign derives his authority. Scepticism is not far off when they ask why they believe their creed. We had all been satisfied about the Gospel history; not a shadow of doubt had crossed the minds of one of us; and though we might not have been able to give a logical reason for our certitude, the certitude was in us, and might well have been let alone. I afterwards read Hume attentively, and though old associations prevented me from recognizing the full force of what he had to say, no doubt I was unconsciously affected by him. I remember insisting to a friend that the essential part of religion was morality. My friend replied that morality was only possible to persons who received power through faith to keep the commandments. But this did not satisfy me, for it seemed contrary to fact. There were persons of the goodness, for instance, of a Unitarian was only apparent. After all is said, the visible conduct of men is the best test that we can have of their inward condition. If not the best, where are we to find a better?

LETTER IV.

TRACT XC. AND ITS CONSEQUENCES.

My dear ——. After I had taken my degree, and before I re-entered upon residence as fellow, my confidence in my Oxford teachers underwent a further trial. I spent some months in Ireland in the family of an Evangelical clergyman. I need not mention names which have no historical notability. My new friends were favourable specimens of a type which was then common in Ireland. The Church of England was becoming semi-Catholic. The Church of Ireland left Catholicism to those to whom it properly belonged. It represented the principles of the Reformation. It was a branch of what Mr. Gladstone has called the Upas-tree of Protestant ascendency. Mr. —— and the circle into which I was thrown were, to begin with, high-bred and cultivated gentlemen. They had seen the world. Some of them had been connected with the public movements of the time. O'Connell was then in his glory. I heard Irish affairs talked of by those who lived in the midst of them. A sharp line of division among the people distinguished the Protestants from the Catholics. The Protestants were industrious and thriving. Mendicancy, squalor, and misery went along with the flocks of the priest, whether as cause or effect of their belief, or in accidental connection with it, I could not tell. The country was outwardly quiet, but there were ominous undertones of disaffection. There were murders now and then in the mountains, and I was startled at the calmness with which they were spoken of. We were in the midst of the traditions of 1798. My friend's father had been attacked in his palace, and the folios in the library bore marks of having been used to barricade the windows. He himself spoke as if he was living on a volcano; but he was as unconcerned as a soldier at his post, and so far as outward affairs went he was as kind to Catholics as to Protestants. His outdoor servants were Catholics, and they seemed attached to him; but he knew that they belonged to secret societies, and that if a quiet good sense, an intellectual breadth of feeling in this household, which to me, who had been bred up to despise Evangelicals as unreal and affected, was a startling surprise. I had looked down on Dissenters especially, as being vulgar among their other enormities; here were persons whose creed differed little from that of the Calvinistic Methodists, yet they were easy, natural, and dignified. In Ireland they were part of a missionary garrison, and in their daily lives they carried the colours of their faith. In Oxford, reserve was considered a becoming feature in the religious character. The doctrines of Christianity were mysteries, and mysteries were not to be lightly spoken of. Christianity at —— was part of the atmosphere which we breathed; it was the great fact of our existence, to which everything else was subordinated. Mystery it might be, but not more of a mystery than our own bodily lives, and the system of which we were a part. The problem was to arrange all our thoughts and requirements in harmony with the Christian revelation, and to act it out consistently in all that we said and did. The family devotions were long, but there was no formalism, and everybody took a part in them. A chapter was read and talked over, and practical lessons were drawn out of it; otherwise there were no long faces or solemn affectations; the conversations were never foolish or trivial; serious subjects were lighted up as if by an ever-present spiritual sunshine.

Such was the new element into which I was introduced under the shadow of the Irish Upas-tree; the same uniform tone being visible in parents, in children, in the indoor servants, and in the surrounding society. And this was Protestantism. This was the fruit of the Reformation which we had been learning at Oxford to hate as rebellion and to despise as a system without foundation. The foundation of it was faith in the authority of Holy Scripture, which was supposed to be verbally inspired; and as a living witness, the presence of Christ in the heart. Here, too, the letter of the word was allowed to require a living authentication. The Anglo-Catholics at Oxford maintained that Christ was present in the Church; the Evangelicals said that he was present in the individual believing soul, and why might they not be right? So far as Scripture went they had promises to allege for themselves more definite than the Catholics. If the

My feelings of reverence for the Reformers revived. Fact itself was speaking for them. Beautiful pictures had been put before us of the mediæval Church which a sacrilegious hand had ruthlessly violated. Here on one side we saw the mediæval creed in full vitality with its fruits upon it which our senses could test; on the other, equally active, the fruits of the teaching of Luther and Calvin. I felt that I had been taken in, and I resented it. Modern history resumed its traditionary English aspect. I went again over the ground of the sixteenth century. Unless the intelligent part of Europe had combined to misrepresent the entire period, the corruption of Roman Catholicism had become intolerable. Put the matter as the Roman Catholics would, it was a fact impossible to deny, that they had alienated half Europe, that the Teutonic nations had risen against them in indignation, and had substituted for the Christianity of Rome the Christianity of the Bible. They had tried, and tried in vain, to extinguish the revolt in blood, and the national life of modern England had grown up out of their overthrow. With the Anglo-Catholics the phenomena were the same in a lighter form. The Anglo-Catholics, too, had persecuted so far as they dared; they, too, had been narrow, cruel, and exclusive. Peace and progress had only been made possible when their teeth were drawn and their nails pared, and they were tied fast under the control of Parliament. History, like present reality, was all in favour of the views of my Evangelical friends.

And if history was in their favour, so were analogy and general probability. Mediæval theology had been formed at a time when the relations of matter and spirit had been guessed at by imagination, rather than studied with care and observation. Mind it was now known could only act on matter through the body specially attached to it. Ideas reached the mind through the senses, but it was by method and sequence which, so far as experience went, was never departed from. The Middle Ages, on the other hand, believed in witchcraft and magic. Incantation could call up evil angels and control the elements. The Catholic theory of the Sacraments was the counterpart of enchantment. Outward mechanical acts which, except as symbols, had no meaning, were supposed to produce spiritual changes, and spoken words to produce, like spells, changes in material substance. The imposition of a bishop's hands conferred supernatural powers. An ordained priest altered the nature of the elements in the Eucharist by consecrating them. Water and a prescribed formula regenerated an infant in baptism. The whole Church, it was true, had held these opinions down to the sixteenth century. But so it had believed that medicine was only efficacious if it was blessed; so it had believed that saints' relics worked miracles. Larger knowledge had taught us that magic was an illusion, that spells and charms were fraud or folly. The Reformers in the same way had thrown off the notion that there was anything mysterious or supernatural in the clergy or the Sacraments. The clergy in their opinion were like other men, and were simply set apart for the office of teaching the truths of religion. The Sacraments were symbols, which affected the moral nature of those who could understand them, as words or pictures, or music, or anything else which had an intelligible spiritual meaning. They brought before the mind in a lively manner the facts and principles of Christianity. To regard them as more was superstition and materialism. Evangelicalism had been represented to me as weak and illiterate. I had found it in harmony with reason and experience, and recommended as it was by personal holiness in its professors, and general beauty of mind and character, I concluded that Protestantism had more to say for itself than my Oxford teachers had allowed.

For the first time, too, among these good people I was introduced to Evangelical literature. Newton and Faber had given me good reasons when I was a boy for believing the Pope to be the man of sin: but I had read nothing of Evangelical positive theology, and books like the 'Pilgrim's Progress' were nothing less than a revelation to me. I do not mean that I could adopt the doctrine in the precise shape in which it was presented to me, that I was *converted*, or anything of that kind; but I perceived that persons who rejected altogether the theory of Christianity which I had been taught to regard as the only tenable one, were as full of the spirit of Christ, and had gone through as many, as various, and as subtle Christian experiences as the most developed saint in the Catholic calendar. I saw it in their sermons, in their hymns, in their conversation. A clergyman, who was afterwards a bishop in the Irish Church, declared in my hearing that the theory of a Christian priesthood was a fiction; that the notion of the Sacraments as having a mechanical efficacy irrespective of their conscious

M. R. JAYAKAR
MALABAR HILL
BOMBAY

effect upon the mind of the receiver was an idolatrous superstition; that the Church was a human institution, which had varied in form in different ages, and might vary again; that it was always fallible; that it might have bishops in England, and dispense with bishops in Scotland and Germany; that a bishop was merely an officer; that the apostolical succession was probably false as a fact—and, if a fact, implied nothing but historical continuity. Yet the man who said these things had devoted his whole life to his Master's service—thought of nothing else, and cared for nothing else.

The opinions were of no importance in themselves; I was, of course, aware that many people held them; but I realized now for the first time that clergymen of weight and learning in the Church of England, ordained and included in its formularies, could think in this way and openly say so, and that the Church to which Newman and Keble had taught us to look as our guide did not condemn them. Clearly, therefore, if the Church equally admitted persons who held the sacramental theory, she regarded the questions between them as things indifferent. She, the sovereign authority, if the Oxford view of the Church's functions was correct, declared that on such points we might follow our own judgment.

This conclusion was forced home upon me, and shook the confidence which I had hitherto continued to feel in Newman. It was much in itself, and it relieved me of other perplexities. The piety, the charity, the moral excellence in the circle into which I had been thrown were evidences as clear as any evidence could be of a living faith. If the Catholic revivalists were right, these graces were but natural virtues, not derived through any recognized channel, uncovenanted mercies, perhaps counterfeits, not virtues at all, but cunning inventions of the adversary. And it had been impossible for me to believe this. A false diamond may gain credit with eyes that have never looked upon the genuine gem, but the pure water once seen cannot be mistaken. More beautiful human characters than those of my Irish Evangelical friends I had never seen, and I have never seen since. Whatever might be the 'Notes of the Church,' a holy life was the first and last of them; and a holy life it was demonstratedly plain to me, was no monopoly of the sacramental system.

At the end of a year I returned to Oxford. There had been a hurricane in the interval, and the storm was still raging. Not the University only, but all England, lay and clerical, was agitating itself over Tract XC. The Anglican Church had been long ago described as having a Catholic Prayer-book, an Arminian clergy, and Calvinistic Articles. When either of the three schools asserted itself with emphasis the others took alarm. Since the revolution of 1688 Church and clergy had been contented to acquiesce in the common title of Protestant; by consent of high and low the very name of Catholic had been abandoned to the Romanists; and now when a Catholic party had risen again, declaring that they and they only were true Church of England men, the Articles, not unnaturally, had been thrown in their teeth. All the clergy had subscribed the Articles. The Articles certainly on the face of them condemned the doctrines which the revivalists had been putting forward. Weak brothers among them were beginning to think that the Articles had committed the Church to heresy, and that they ought to secede. There were even a few who considered that their position was not so much as honest. I recollect the Professor of Astronomy saying to me about this time that the obligation of a Tractarian to go to Rome was in the ratio of his intellectual obtuseness. If he was clever enough to believe two contradictory propositions at the same time, he might stay in the Church of England; if his capacity of reconciliation was limited, he ought to leave it. It was to soothe the consciousness of these troubled spirits that Tract XC. was written. As their minds had opened they had recognized in the mass, in purgatory, in the authority of tradition, in infallibility of councils, doctrines which down to the schism had been the ancient faith of Christendom. The Articles seemed distinctly to repudiate them; and if these doctrines were true the body which rejected them could be no authentic branch of the Church Catholic. Newman undertook to remove this difficulty. He set himself to 'minimize' what the Articles said, just as in latter years he has 'minimized' the decree of Papal infallibility. He tells us that he cannot understand a religion which is not dogmatic; but he too finds tight-lacing uncomfortable; and though he cannot do without his dogma, it must mean as little as possible for him. He argues, in the first place, that the Articles could not have been intended to contradict the canons of the Council of Trent, as was popularly supposed, because they had been composed several years before those canons were published or the Council itself completed. Secondly, that they were directed not against Catholic doctrines, but against the popular abuses of those doctrines. They condemned 'masses;' they did not condemn the mass. They condemned the Romish doctrine of purgatory; but the Romish was not the Greek, and there might be many others. Finally, the Articles were legal documents, and were to be interpreted according to the strict meaning of the words. We do not interpret an Act of Parliament by what we know from other sources of the opinions of its framers; we keep to the four corners of the Act itself. Newman said that we had as little occasion to trouble ourselves with the views of individual bishops in the sixteenth century.

The English mind does not like evasion; and on its first appearance the Tract was universally condemned as dishonest. Very good people, my Irish friends among them, detested it, not for the views which it advocated, but as trifling with truth. I could not go along with them, partly because it had become plain to me that, little as they knew it, they themselves had at least equally to strain the language of the Baptismal Service, and of one of the three absolutions; partly because I considered Newman's arguments to be legally sound. Formulas agreed on in councils and committees are not the produce of any one mind or of any one party. They are compromises in which opposing schools of thought are brought at last to agree after many discussions and alterations. Expressions intended to be plain and emphatic, are qualified to satisfy objectors. The emphasis of phrases may remain, but the point emphasized has been blunted. The closer all such documents are scrutinized the more clear becomes the nature of their origin. Certainly, if the Catholic theory is correct, and if the Holy Spirit really instructs mankind through the medium of councils, and therefore through decrees which have been shaped in a manner so human, one can but wonder at the method that has been chosen. It seems like a deliberate contrivance to say nothing in seeming to say much; for there are few forms of words which cannot be perforated by an acute legal intellect. But as far as Tract XC. was concerned, public opinion, after taking time to reflect, has pronounced Newman acquitted. It is historically certain that Elizabeth and her ministers intentionally framed the Church formulas so as to enable every one to use them who would disclaim allegiance to the Pope. The English Catholics, who were then more than half the nation, applied to the Council of Trent for leave to attend the English Church services, on the express ground that no Catholic doctrine was denied in them. The Council of Trent refused permission, and the petitioners, after hesitating till in the defeat of the

Armada Providence had declared for the Queen, conformed (the greater number of them) on their own terms. They had fought for the Crown in the civil wars; they had been defeated, and since the Revolution had no longer existed as a theological party. But Newman was only claiming a position for himself and his friends which had been purposely left open when the constitution of the Anglican Church was formed.

But religious men do not argue like lawyers. The Church of England might have been made intentionally comprehensive three centuries ago, but ever since 1688 it had banished Popery and Popish doctrines. When the Catholics were numerous and dangerous, it might have been prudent to conciliate them; but the battle had been fought out since, and a century and a half of struggles and conspiracies and revolutions and dethroned dynasties were not to go for nothing. Compromise might have dictated the letter of the Articles, but unbroken usage for a hundred and fifty years had created a Protestant interpretation of them which had become itself authoritative. Our fathers had risked their lives to get rid of Romanism. It was not to be allowed to steal into the midst of us again under false colours. So angry men said at the time, and so they acted.

Newman, however, had done his work. He had broken the back of the Articles. He had given the Church of our fathers a shock from which it was not to recover in its old form. He had written his Tract, that he might see whether the Church of England would tolerate Catholic doctrine. Had he waited a few years, till the seed which he had sown could grow, he would have seen the Church unprotestantizing itself more ardently than his most sanguine hope could have anticipated, the squire parsons of the Establishment gone like a dream, an order of priests in their places, with an undress uniform in the world, and at their altars 'celebrating' masses in symbolic robes, with a directory to guide their inexperience. He would have seen them hearing confession, giving absolution, adoring Our Lady and professing to receive visits from her, preaching transubstantiation and purgatory and penance and everything which his Tract had claimed for them; founding monasteries and religious orders, washing out of their naves and chancels the last traces of Puritan sacrilege; doing all this in defiance of courts of law and Parliaments and bishops, and forcing the authorities to admit that they cannot be interfered with. It has been a great achievement for a single man; not the less so that, although he admitted that he had no right to leave the Church in which he was born unless she repudiated what he considered to be true, he himself would not even pause to discern whether she would repudiate it or not.

But Newman, though he forbids private judgment to others, seems throughout to retain the right of it for his own guidance. He regarded the immediate treatment of the message which he had delivered as the measure of his own duty. His convictions had grown slowly on himself; they were new to the clergy, unpalatable to the laity, violently at variance with the national feelings and traditions. Yet the bishops were expected to submit on the spot, without objection or hesitation, to the dictation of a single person; and because they spoke with natural alarm and anxiety, his misgivings about the Catholicity of the Church of England turned instantly into certainties, and in four years carried him away over the border to Popery.

It is evident now, on reading Newman's own history of his religious opinions, that the world, which said from the beginning that he was going to Rome, understood him better than he then understood himself, or, perhaps, than he understands himself now. A man of so much ability would never have rushed to conclusions so precipitately merely on account of a few bishops' charges. Excuses these charges might be, or explanations to account for what he was doing; but the motive force which was driving him forward was the overmastering 'idea' to which he had surrendered himself. He could have seen, if he had pleased, the green blade of the Catholic harvest springing in a thousand fields; at present there is scarcely a clergyman in the country who does not carry upon him in one form or other the marks of the Tractarian movement. The answer which he required has been given. The Church of England has not only admitted Catholic doctrine, but has rushed into it with extraordinary enthusiasm. He might be expected to have recognized that his impatient departure has been condemned by his own arguments. Yet the 'Apologia' shows no repentance nor explains the absence of it. He tells us that he has found peace in the Church of Rome, and wonders that he could ever have hoped to find it in the English Communion. Very likely. Others knew how it would be from the first. He did not know it; but if the bench of bishops had been as mild and enduring as their present successors, it would have made no difference.

Newman was living at Littlemore, a village three miles from Oxford, when I came back from Ireland.

He had given up his benefice, though still occasionally preaching in St. Mary's pulpit before the University. He was otherwise silent and passive, though his retirement was suspected, and he was an object of much impertinent curiosity. For myself he was as fascinating as ever. I still looked on him—I do at this moment—as one of the two most remarkable men whom I have ever met with; but I had learnt from my evangelical experiences that equally good men could take different views in theology, and Newmanism had ceased to have exclusive interest to me. I was beginning to think that it would be well if some of my High Church friends could remember also that opinions were not everything. Many of them were tutors, and tutors responsible for the administration of the University. The discipline was lax, the undergraduates were idle and extravagant; there were scandalous abuses in college management, and life at the University was twice as expensive as it need have been. Here were plain duties lying neglected and unthought of, or, if remembered at all, remembered only by the Liberals, whom Newman so much detested. Intellectually, the controversies to which I had listened had unsettled me. Difficulties had been suggested which I need not have heard of, but out of which some road or other had now to be looked for. I was thrown on my own resources, and began to read hard in modern history and literature. Carlyle's books came across me; by Carlyle I was led to Goethe. I discovered Lessing for myself, and then Neander and Schleiermacher. The 'Vestiges of the Natural History of Creation,' which came out about that time, introduced modern science to us under an unexpected aspect, and opened new avenues of thought. As I had perceived before that the Evangelicals could be as saint-like as Catholics, so now I found that men of the highest gifts and unimpeached purity of life could differ from both by whole diameters in the interpretation of the same phenomena. Further, this became clear to me, that the Catholic revival in Oxford, spontaneous as it seemed, was part of a general movement which was going on all over Europe. In France, in Holland, in Germany, intellect and learning had come to conclusions from which religion and conscience were recoiling. Pious Protestants had trusted themselves upon the Bible as their sole foundation. They found their philosophers and professors assuming that the Bible was a human composition—parts of it of doubtful authenticity, other parts bearing marks on them of the mistaken opinions of the age when these books were written;

and they were flying terrified back into the Church from which they had escaped at the Reformation, like ostriches hiding their heads in a bush.

Yet how could the Church, as they called it, save them? If what the philosophers were saying was untrue, it could be met by argument. If the danger was real, they were like men caught in a thunder-storm, flying for refuge to a tree, which only the more certainly would attract the lightning. Catholics are responsible for everything for which Protestants are responsible, plus a great deal besides which Protestants rejected once as lies, and the stroke will fall where the evidence is weakest. Christianity, Catholic and Protestant alike, rests on the credibility of the Gospel history. Verbal inaccuracies, if such there be, no more disprove the principal facts related in the Gospels than mistakes in Lord Clarendon's History of the Rebellion prove that there was never a commonwealth in England. After all is said, these facts must be tested by testimony, like all other facts. The personal experiences of individuals may satisfy themselves, but are no evidence to others. Far less can the Church add to the proof, for the Church rests on the history, not the history on the Church. That the Church exists, and has existed, proves no more than that it is an institution which has had a beginning in time, and may have an end in time. The individuals of whom it is composed have believed in Christianity, and their witness is valuable according to their opportunities, like that of other men, but this is all. That the Church as a body is immortal, and has infallible authority antecedent to proof, is a mere assumption, like the tortoise in the Indian myth. If the facts cannot be established, the Catholic theory falls with the Protestant; if they can, they are the common property of mankind, and to pile upon them the mountains of incredibilities for which the Catholic Church has made itself answerable, is only to play into the hands of unbelievers, and reduce both alike to legend.

Still, the reaction was a fact, visible everywhere, especially in Protestant countries. The bloody stains on the Catholic escutcheon were being painted over. The savage massacres, the stake at Smithfield, and the Spanish auto-da-fé, the assassinations and civil wars and conspiracies at which we had shuddered as children, were being condoned or explained away. Hitherto it had been strenuously denied that the Oxford movement was in the direction of Rome; it was insisted rather that, more than anything else, Tractarianism would tend to keep men away from

Rome. No Protestant had spoken harder things of the Roman see and its doings than Newman had and I was still for myself unable to believe that he was on his way to it. But the strongest swimmers who are in the current of a stream must go where it carries them, and his retirement from active service in the Church of England showed that he himself was no longer confident.

LETTER V.

THE LIVES OF THE SAINTS.

MY DEAR ——. I said in my last letter that at the time at which Newman withdrew from Oxford to Littlemore there was nothing to lead us generally to suppose that he meditated secession. Tract XC., in spite of the outcry, had not been condemned by any legally constituted court. No existing law had been broken by it, and there was no likelihood of fresh Parliamentary legislation. He had in fact won the battle. He had established his principle. If he chose to hold and teach his Catholic doctrines as a member of the Church of England, it was clear that he would not be driven out of it. If he had meant to leave the Church of England, Tract XC. would have been gratuitous and an impertinence.

Thus, when it was announced that he was to bring out a series of biographies of distinguished English saints, the proposal seemed to fall in with the theory of the continuity of the mediæval and the existing English Church. The great names upon the Calendar belonged not to Rome, but to us; they were part of our national history, and when I was myself asked to assist, the proposal pleased and flattered me. I suppose now that the object was to recommend asceticism, and perhaps to show that the power of working miracles had been continued in the Church until its unity was broken. But no such intention was communicated to us. We were free to write as we pleased, each on our own responsibility. For myself I went to work with the assumption which I thought myself entitled to make, that men who had been canonized had been probably good men, and at least remarkable men. It was an opportunity for throwing myself into mediæval literature, and studying in contemporary writings what human life had really been like in this island, in an age of which the visible memorials remained in churches and cathedrals and monastic ruins.

I do not regret my undertaking, though I little guessed the wilderness of perplexities into which I was throwing myself. I knew that I was entering a me completely for what I should find. The order of nature, whether always unbroken or not, is generally uniform. In the lives of the Christian saints the order of nature seems only to have existed to give holy men an opportunity of showing their superiority to material conditions. The evidence is commonly respectable. The biographer may be a personal friend, or at least the friend of a friend; yet not 'Jack the Giant-killer' or the 'Arabian Nights' introduces one more entirely into a supernatural world. When a miracle occurs the unbeliever is astonished; the believer, who records the story, sees no more than he expects. He looks only to the object, and if the motive is sufficient, the more marvellous the event the more likely it is to have occurred, and the less it requires proof or critical examination. If a sceptic dares to doubt, it is only that he may be the more utterly confounded. The accounts are given gravely, as if they were of real facts, without grace, without imagination, without any of the ornamental work of acknowledged invention—the sublime and ridiculous mixed together indiscriminately, with the ridiculous largely predominating. Was it possible that such stuff could be true? or even intended to be taken for truth? Was it not rather mere edifying reading for the monks' refectories; the puerile absurdities thrown in to amuse innocently their dreary hours? Was it not as idle to look for historical truth in the lives of the saints as in 'Amadis de Gaul' or 'Orlando Furioso'?

It seemed so, and yet it seemed not so. For the great saints (or for the small saints where they had founded religious houses) there were special commemorative services, in which their most grotesque performances were not forgotten. It was not easy to believe that men specially called religious, and who considered truth to be one of the duties which religion prescribed, could thus deliberately consecrate what they knew, and would admit, to be lies. There is a class of composition which is not history, and is not conscious fiction—it was produced in old times; it is produced in our times; it will be produced wherever and as long as human society exists—something which honestly believes itself to be fact, and is created, nevertheless, by the imagination. The stories of the Edda were not felt to be false when they were sung in old Danish halls. The genuine myth is not invented—is not written—but grows. It begins from a small seed, and unfolds into form as it passes from lip to lip. It is then assigned by tradition to a particular person. 'The story I tell you came from So-and-So,' says some one, wishing to give it credibility. 'He was on the spot and saw or heard it.' 'So-and-So' may never have heard of it; but the story may still survive and carry his name along with it as a further legend. Now, and always, remarkable persons become mythical. Anecdotes are told of them, almost always inaccurate; words are assigned to them which they never spoke. Smaller luminaries are robbed to swell the greatness of the central orb. We, in these days of equality, disbelieve in exceptional heroes, as the Middle Ages believed in them. Disbelief shows itself in scandal. There is a pleasure in finding that an eminent man is but a mortal after all, and proof of weakness can be discovered if it is wanted. Great qualities, on the other hand, are magnetic, and every report, good or evil, true or false, about persons possessed of them is likely to stick. Hero-worship and saint-worship are honourable forms of a universal tendency; but it is idle to expect from worshippers an accurate investigation into fact. Evidently the stories which I was studying were legends, though in sober prose —legends which were never examined into, because it would have been a sin to doubt them. There was one sceptic even among the apostles; but St. Thomas was held up as an example to be shunned. According to the doctrines of the Church the spirit of belief was angelic, the spirit of doubt was devilish; and thus in devout ages, and in the devout atmosphere of convents and monasteries, the volume of spiritual wonders grew unchecked. To balance evidence and compare the degrees of it is mere waste of time. The evidence of such witnesses is worth nothing, unless they can be produced and cross-examined. The child when he has first seen a conjurer, the disciple who has been at a spiritualist's séance, cannot report faithfully what has passed immediately under his eyes. To have seen something which he cannot understand delights him, and he describes it with the unconscious omissions and exaggerations which make a natural explanation impossible. So it was with the hagiologist. He tells his story in good faith. Perhaps we have the authentic narrative of an eye-witness. Yet the only fact of which we can feel assured is that he believed, or professed to believe, that the subject of it worked miracles. He has a conviction, to begin with, that holy men had powers of this kind, and therefore it was a matter of course that these powers should have shown themselves. Character is no protection. We may assume that Anselm, for instance, would report nothing which he did not suppose to be true; but piety, which is a security for good faith, is none against credulity; or perhaps, if we could have asked Anselm, we should have found that his very notion of truth was not our notion; that he meant by truth, truth of idea, rather than literal truth of fact. Intellect, again, is no protection. Among the saints' biographers are found the greatest names in the Church. Athanasius wrote a life of St. Anthony; Bede wrote a life of St. Cuthbert. It is not too much to say that both these distinguished men, and the thousand smaller men who followed in their tracks, were *possessed*, and that things which were not appeared to them as things that were. So it is in our own time. The pious Catholic tells us that he cannot resist the evidence for the liquefaction of the blood of St. Januarius; that is, any number of witnesses can be brought to declare that they have seen it. If the smallest civil action in an English court of justice turned on the liquefying of blood under similar circumstances, and a thousand witnesses swore they had seen it, the evidence would go for nothing, unless the substance called blood had been examined and analyzed by competent chemists, and the process repeated in the presence of trained observers. Ordinary spectators see phenomena every day which to them are equally inexplicable, at Maskelyne and Cooke's. Miracles, authenticated by the same kind of testimony, and the same degree of it, are worked at Lourdes and at Knock, and at saints' shrines, and at mesmeric doctors' reception rooms. The testimony of credulous and ignorant people in such cases is simply worthless, and the multiplication of nothing remains nothing still. As to St. Januarius, it is noticeable that a miracle, closely resembling that which modern Catholics believe, used to be worked in the same Neapolitan territory in the Roman times. Horace, describing the various stations at which he stopped on his way from Rome to Brindisi, says—

> Dehinc Gnatia Lymphis
> Iratis extructa dedit risusque jocosque,
> Dum flammâ sine thura liquescere limine sacro
> Persuadere cupit. Credat Judæus Apella,
> Non ego—namque Deos didici securum agere ævum;
> Nec siquid miri faciat natura Deos id
> Tristes ex alto cœli dimittere tecto.

Cardinal Newman, with the Jew Apella, would have believed in the supernatural liquefaction of the incense. Horace in like manner would 'laugh and jest' at St. Januarius. It is not a matter of proof but of temperament. Why should we allow our convictions on the most serious of subjects to be influenced by evidence which we should not dare to admit if we were deciding a common civil criminal case?

For an intending biographer this was a serious discovery. I could not repeat what I found written, for the faith was wanting. A spiritualist many years after assured me that I could work a miracle myself if I had but faith. Could I but have faith in the Great Nothing all things would be possible for me—but, alas! I had none. So with the lives of the saints. St. Patrick I found once lighted a fire with icicles, changed a Welsh marauder into a wolf, and floated to Ireland upon an altar stone. I thought it nonsense. I found it eventually uncertain whether Patricius was not a title, and whether any single apostle of that name had so much as existed. After a short experiment I had to retreat out of my occupation, and let the series go on without me. But the excursion among the Will-o'-the-wisps of the spiritual morasses did not leave me as it found me. I was compelled to see that in certain conditions of mind the distinction between objective and subjective truth has no existence. An impression is created that it is fit, right, or likely that certain things should take place, and the outward fact is assumed to correspond with that conviction is as complete as the most searching investigation could have made it. His own feeling that something is true is to him complete evidence that it is true. True it may be; and yet not true in the sense which he attaches to the word. There are several kinds of truth. There is the truth of pure mathematics, which is perfect as long as it concerns lines or figures which exist only as abstractions. There is the truth of a drama like 'Hamlet,' which is literary invention, yet is a true picture of men and women. There is the truth of a fable. There is the truth of an edifying moral tale. There is the truth of a legend which has sprung up involuntarily out of the hearts of a number of people, and therefore represents something in their own minds. Finally, there is the dull truth of plain experienced fact, which has to be painfully sifted out by comparison of evidence, by observation, and, when possible, by experiment, and is held at last, after all care has been taken, by those who know what truth of fact means, with but graduated certainty, and as liable at all times to revision and correction. The distinction, commonplace as it seems, was forgotten by the hagiologists.

It is forgotten, for that matter, by most historians. All men, when their feelings are interested, believe what they wish to believe, or what their preconceptions represent to them as internally probable. Theologians avow that other methods besides examination of evidence are required to establish the truths of faith. The truths of faith must be held with absolute certitude. The truths of science, the most assured of them, are held only as high probabilities; and the evidence has therefore to be supplemented by emotion, imagination, and speculative reasoning introduced from adjoining provinces. Cardinal Newman describes in his 'Grammar of Assent' the process by which probabilities are converted into certainties; with the help of it he can justify his own belief in the miracle at Naples. He can create antecedent likelihoods which dispense with completeness of proof, or remove antecedent unlikelihoods which call for fuller and more minute proofs. It is the theory on which, unconsciously held, the crop of legends in the Catholic Church has grown for century after century, and is growing now luxuriant as ever. It is the theory on which Our Lady is believed to be showing herself in France, in Ireland, or more recently to the Anglican monks at Llantony. It is not a theory by which any truth was ever discovered that can be tested, and sifted, and verified by experiment, or applied to the practical service of mankind.

And this leads me to say a very few words on a subject to which I alluded in an earlier letter; the question that rose fifteen years ago between Cardinal Newman and Charles Kingsley. Mr. Kingsley, writing impetuously as he often did, said that the Catholic clergy did not place truth among the highest virtues, and he added that Father Newman acknowledged it. Father Newman asked him when he had acknowledged it, and a controversy followed in which Kingsley, instead of admitting, as he ought to have done, that he had spoken unadvisedly and in too sweeping terms, defended himself, and defended himself unsuccessfully. Kingsley, in truth, entirely misunderstood Newman's character. Newman's whole life had been a struggle for truth. He had neglected his own interests; he had never thought of them at all. He had brought to bear a most powerful and subtle intellect to support the convictions of a conscience which was superstitiously sensitive. His single object had been to discover what were the real relations between man and his Maker, and to shape his own conduct by the conclusions at which he arrived. To represent such a person as careless of truth was neither generous nor even reasonable. But Newman as little understood his adversary. He was not called on, perhaps, to look far into a subject which did not concern him. He had been attacked, as he thought, wantonly. He struck back; and he struck most effectively.

Kingsley, however, had passed through his own struggles. He, too, had been affected at a distance by the agitations of the Tractarian controversy. He, like many others, had read what Newman had written about ecclesiastical miracles. The foundations of his own faith had been disturbed. He was a man of science; he knew what evidence was. He believed that Newman's methods of reasoning confounded his perceptions of truth, disregarding principles which alone led to conclusions that could be trusted in other subjects, and which, therefore. he could alone trust in religion. His feelings had been, perhaps, embittered by the intrusion of religious discord into families in which he was interested, traceable all of it to the Oxford movement. He himself had determined to try every fact which was offered for his belief by the strict rules of inductive science and courts of justice; and every other method appeared to him to be treason to his intellect and to reduce truth, where truth of fact was before everything essential, to the truth of fable, or fiction, or emotional opinion. This was at the bottom of his mind, however unguardedly he expressed himself. He was an orthodox Protestant. The outward evidence for the Gospel history was strong in itself. It was supplemented by the effect which Christianity had produced in the world, by the position which it had assumed, and the renovation which it had produced in the human heart and character. It was supplemented in himself by personal experience. He has told me of answers which he had received to his prayers. But this, as he was well aware, was evidence to himself alone. He stood, practically, on the broad ground that religion, that the fear of God, was alone able to make alive the nobler part of man's nature. This was plain matter of outward experience which the whole history of the world could verify. To him, when he was placed as a clergyman in the Church of England, the fear of God was bound up with the form of religion established in his own country. He knew as well as any one that human errors were continually forcing themselves into the popular creeds. There had been changes in the past, there might be changes in the future; meanwhile, he held fast himself by the English

Church as it had been purified by the Reformers in the sixteenth century. In his opinion, to take up again the traditions and beliefs which had been then abandoned, was to return like the dog to his vomit—a thing impossible to do sincerely, a thing impious to attempt to do in wilfulness or fancy, and certain to avenge itself by a contemptuous rejection of all religion whatever. The Puritans had whitewashed the churches, broken the windows in which the miracles of the saints had shone in glorious colours, replaced the pictures on the walls with plain texts from Scripture. They would have no lies either taught or suggested in God's house, whatever might be done elsewhere. The Catholic reaction, with its decorations, its choral services, its celebrations, its vestments, its wardrobes of devotional machinery, was similarly detestable to Kingsley. If the creed was true, no tone of voice could be too plain and simple in repeating facts of such infinite importance. To leave it to be chanted by a parcel of boys in surplices could but suggest at last that it was not true, as facts are true; but was on the level of song or legend like a ballad of Robin Hood. Newman's influence had begun the wild dance, and Kingsley had always thought of him with a kind of resentment.

But enough of this. I return to the lives of the saints and their effect upon myself. The conclusion which I had drawn was that ecclesiastical biographers had composed their stories with the freedom of epic poets, and that religious truths resembled rather the truths of poetry than the truths of history. I had been taught by Newman that there was no distinction in kind between the saints' miracles and the miracles in the Bible. The restoration of the dead man to life by touching Elisha's bones, corresponded to the cures performed by relics. The changing of water into wine, the coin in the fish's mouth, the devils in the swine, the calming of the storm on the lake, the walking on the sea, were stories which, if we met anywhere but where they were, we should call legends; while the power of the saints, like that of apostles and prophets, was exerted chiefly in healing the sick and raising the dead to life.

The parallel had been forced upon us to gain credibility for the marvels of ecclesiastical history; but it was natural, it was inevitable, that the alternative possibility should now suggest itself, that all supernatural stories were legendary wherever we found them. Hume's argument, we had been already told, was intellectually correct. It was more likely, as a mere question of human probability, that men should deceive or be deceived, than that the continuity of nature should have been disturbed. Faith, we had been also told, was to come to the assistance of reason, and reverse the conclusion; but faith was not made more easy when the burden which it was to carry was enlarged by these voluminous additions. The authenticity and inspiration of the Gospels had been assumed till quite recent times as a fact as certain as our own existence. To question either had been forbidden by the law of the land, and biblical criticism had been as impotent as the investigations into the pretensions of holy persons whom the Church had predetermined to canonize. So long as the belief remained unshaken, any answer sufficed for objections. But the case was now altered. Great German scholars had come to a widely different conclusion. Very able men of unblemished character, here at home and elsewhere, were doubting about it; and this could no longer be concealed.

To frighten us off, their personal character had been libelled. I had been brought up to believe that not even a Dissenter could be a really good man, and that unbelievers were profligates seeking only an excuse for indulging their wicked passions.

Such arguments are spectres formidable while they produce fear, but provoking reaction and even indignation when the ghost is found to be but a stuffed figure streaked with phosphorus. It is a very serious thing when a man is brought to recognize that truths, which he has been taught to look upon as indisputable, are not regarded as truths at all by persons competent to form an independent opinion. Such questions need not have been raised in this country. The Oxford revivalists had provoked the storm, but had no spell which would allay it. They did not try to allay it. They used it for their own cause. Those whom I had known best were now far on their way to Rome. 'Either us or nothing,' they said. 'You see where reason leads you. You see what has come of the Reformation. If you do not believe in the Church Catholic and Apostolic, you have no right to believe in God —and the Church Catholic is the Church of Rome.'

So my friends argued. I could not myself admit the alternative. Difficulties there might be, but they told as heavily against Catholics as against Protestants. If the historical foundations of Christianity were shaken, the Church of Rome was in as much danger as the Church of England or the Church of Scotland. It was in more danger, from the additional load of incredibilities which the Protestants had flung from them.

As a matter of experience Catholic countries had bred more infidels than Protestant countries. Voltaire and the Encyclopædists had been pupils of the Jesuits. Vergniaud and Barbaroux, Danton and Robespierre, had been taught as children to pray to the Virgin and the saints. Charles Kingsley had solid ground under his feet compared with the gilded clouds on which the Catholic enthusiasts imagined that they were floating into security.

Newman himself never talked in this wild way. He was too conscious of his own obligation to his early teaching. Protestantism did, as a fact, sustain the belief in Christianity, whether its reasonings were sound or unsound; and he was too wise, too seriously in earnest, to press the logic of alternatives. He was glad that people should believe anyhow, and he had never fallen into the scornful note in which Evangelicals had been scoffed at. But what he said and what he wrote tended practically to the same end. He was surrendering himself to an idea, and was borne along by it as if he were riding on a nightmare. Soon after we heard that he had himself gone over. He had gone, it seems to me (after reading all that he had said about it in the 'Apologia'), as men go when under a destiny, not because their intellect has been convinced by evidence and argument, but because they are impelled by some internal disposition which they suspect while they deny it. His friends might have taken the plunge with a light heart. They had been living in an enchanted circle of thoughts and formulas, and their minds for long had never strayed beyond them. Newman's intellect was keen and clear as ever. He at least knew what he was about. It might have occurred to him to ask when the resolution was once taken, 'What am I not doing, if it is all a dream!'

My eldest brother had left to us younger ones, as a characteristic instruction, that if we ever saw Newman and Keble disagree, we might think for ourselves. The event which my brother had thought as impossible as that a double star should fly asunder in space, had actually occurred. We had been floated out into mid-ocean upon the Anglo-Catholic raft, buoyed up by airy bubbles of ecclesiastical sentiment. The bubbles had burst, the raft was splintered, and we—I mean my other brother and myself—were left, like Ulysses, struggling in the waves.

I need not trouble you with our particular fortunes. I shall have to write you one more letter, and I shall tell you then the little which need be said of my own experiences. It was thought that when Newman went he would create a secession like that of the Free Kirk in Scotland. This was a mistake. With him, either before or immediately after, a few men did go of known ability: Hope Scott, Frederick Faber, Ward of the 'Ideal,' the two Wilberforces, Robert and Henry, and two or three others. The rest, inconsiderable in numbers, were Newman's personal disciples, undistinguished save by piety of life. The seed has grown since, and is still growing, chiefly in families of the better classes, as they are called, among people who have money enough to live upon and nothing to do. Among them the effect has been very wide, and to appearance not salutary. Wives have quarrelled with their husbands, and husbands with wives; the son has been set against the father, and the father against the son; thousands of households have been made miserable by young people dissatisfied with their spiritual condition, and throwing themselves upon Catholic priests because they require, as they fancy, something deeper and truer 'than was enough for the last century.' Great lords and ladies, weary of the emptiness of their lives, have gone to the Church of Rome for a new sensation. Conversion has become fashionable. With the help of Ireland the Catholics have simultaneously become a power in Parliament. Cardinals and Monsignors are to be seen in London drawing-rooms. Convents and monasteries are multiplying. A Catholic tide is still flowing, and no one yet can say how far it may rise. It has affected at present the idle and the ignorant, and has left untouched the industrious and intelligent; but the influence on society has been very considerable.

More remarkable, and infinitely more mischievous, has been the general influence of the Tractarian movement on the Church of England. It was thought at first that Newman's secession had destroyed the party which he had called into being. The shepherd was smitten and the sheep were scattered. The Evangelicals could say that they had been right from the first. Catholic principles led to Rome; they had no place in a Protestant Church. But for the clergy sacerdotalism had a fatal attraction: it gave them professional consequence; they thought that they could keep their wives and their livings and yet recover and wield again their old spiritual authority. They rallied from their confusion; they brightened up their churches; they revolutionized their rituals. In learning they were more than a match for their

Reformation was studied, the more plain became the original intention that Catholics who would abjure the Pope should be comprehended under the Anglican formulas. The Low Church had had their innings; the High Church have now their turn. Had we to live again through the struggle of 1829, we should no longer speak of Catholic emancipation, but of Roman Catholic. The change in the meaning of the word marks the change in popular opinion. Externally the Ritualists have won the battle. They too have their absolutions and their masses, and their monks and nuns and miracles and the rest; and it has been decided that they may keep them. But what a price has the victory cost! The nation has ceased to care what the clergy say or do. The Church of England, as part of the constitution of the country, has ceased to exist. Political latitudinarianism goes on upon its way. The barriers of privilege fall before it. The Third Estate of the realm can no more stay the stream of change than a rush can stay the current of a river. As the Church has become 'Catholic,' the honoured name of Protestant has passed to the Nonconformist. The laity stand aloof, indifferent and contemptuous. The thinking part of it has now a seriousness of its own and a philosophy of its own which has also grown and is growing. The old order of things might have remained indefinitely had it been left undisturbed; but the controversy has undermined its traditions. Questions have been provoked which now must have a real answer. The clergy magnify their office, but the more they make of themselves the less is their intellectual influence. The great body of the English people, which is Protestant to the heart, will never allow their pretensions; and while they are discussing among themselves the nature of their supernatural commission, they are driving science and criticism to ask if there is anything in the world supernatural at all. The storm will die away, agitation is wearisome, and we may subside into a dull acquiescence even with the travestie of ecclesiasticism which is now in possession of the field. But the active mind of the country will less and less concern itself with a system which it despises. A ritualist English Church will be as powerless over the lives of the people as the Roman augurs over the Rome of Cicero and Cæsar; and centuries will pass before religion and common sense will again work together with the practical harmony which existed between them in the days of Whately and Arnold, and Hare and Sedgwick.

This is the substance of what I have to say to you, and here I might end; but something is still left which will require another letter.

LETTER VI.

MY DEAR ——. My narrative is ended. I have told you what I can personally remember of the origin and course of the Tractarian movement. I have now to add a few more words about the remarkable man whose name has been so often mentioned in these letters. I said that I thought he had been *possessed* with a particular idea. His own words will explain what I conceive that idea to have been. Cardinal Newman is the one thinker of commanding intellect who has advised us to seek shelter from the distractions of this present age in the Roman Catholic Church. A passage in the 'Apologia' is a photograph of his inmost heart, and explains the premisses of which this is the conclusion. It is long, but it is so beautiful that the reader who has never seen it before will wish that it was longer. I will say afterwards, in my poor language, why I for one could not go with him, but preferred to steer away into the open ocean. I believed that it was a siren's song, and that the shore from which it came had been strewn for centuries with the bones of the lost mariners who were betrayed by such enchanting music.

'Starting with the being of God (which is as certain to me as the certainty of my own existence, though when I try to put the grounds of that certainty into logical shape, I find a difficulty in doing so, in mood and figure, to my satisfaction), I look out of myself into the world of men, and there I see a sight which fills me with unspeakable distress. The world seems simply to give the lie to that great truth of which my whole being is so full; and the effect upon me is in consequence, as a matter of necessity, as confusing as if it denied that I am in existence myself. If I looked into a mirror and did not see my face, I should have the sort of feeling which actually comes upon me when I look into this living busy world and see no reflex of its Creator. This is to me one of the great difficulties of this absolute primary truth to which I referred just now. Were it not for the voice speaking so clearly in my conscience and my heart, I should be an Atheist, or a Pantheist, or a Polytheist, when I looked into the world. I am speaking for myself only, and I am far from denying the real force of the arguments in proof of a God, drawn from the general facts of human society; but these do not warm me or enlighten me; they do not take away the winter of my desolation, or make the buds unfold and the leaves grow within me, and my moral being rejoice. The sight of the world is nothing else than the prophet's scroll, full of lamentation, and mourning, and woe.

'To consider the world in its length and breadth, its various history, the many races of men, their starts, their fortunes, their mutual alienation, their conflicts; and then their ways, habits, governments, forms of worship, their enterprises, their aimless courses, their random achievements and acquirements, the impotent conclusion of long-standing facts, the tokens so faint and broken of a superintending design, the blind evolution of what turn out to be great powers or truths; the progress of things as if from unreasoning elements, not towards final causes; the greatness and littleness of man, his far-reaching aims, his short duration, the curtain hung over his futurity; the disappointments of life, the defeat of good, the success of evil, the pervading idolatries, the corruptions, the dreary, hopeless irreligion, that condition of the whole race so fearfully yet exactly described in the apostle's words, "Having no hope, and without God in this world;" all this is a vision to dizzy and appal, and inflicts upon the mind a sense of profound mystery which is absolutely beyond human solution.

'What shall be said of this heart-piercing, reason-bewildering fact? I can only answer that either there is no Creator, or this living society of men is, in a true sense, discarded from his presence. Did I see a boy of good make and mind, with the token on him of a refined nature, cast upon the world without provision, unable to say whence he came, his birth-place or his family connections, I should conclude that there was some mystery connected with his history, and that he was one of whom, for one cause or another, his parents were ashamed. Thus only should I be able to account for the contrast between the promise and condition of his being. And so I argue about the world; if there be a God, since there is a God, the human race is implicated in some terrible aboriginal calamity. It is out of joint with the purposes of its Creator. This is a fact, a fact as true as the fact of its existence; and thus the doctrine of what is theologically called original sin becomes to me almost as certain as that the world exists, and as the existence of God.

'And now, supposing it were the blessed and loving will of the Creator to interfere in this anarchical condition of things, what are the methods which might be necessarily or naturally involved in his object of mercy? Since the world is in so abnormal a state, surely it would be no surprise to me if the interposition were of necessity equally extraordinary, or what is called miraculous. But that subject does not directly come into the scope of my present remarks. Miracles as evidence involve an argument; and I, of course, am thinking of some means which does not immediately run into argument. I am rather asking what must be the antagonist by which to withstand and baffle the fierce energy of passion, and the all-corroding, all-dissolving scepticism of the intellect in religious inquiries. I have no intention at all to deny that truth is the real object of our reason; and that if it does not attain to truth, either the premiss or the process is in fault; but I am not speaking of right reason, but of reason as it acts in fact and concretely in fallen man. I know that even the unaided reason, when correctly exercised, leads to a belief in God, in the immortality of the soul, and in a future retribution. But I am considering it actually and historically, and in this point of view I do not think I am wrong in saying that its tendency is towards a simple unbelief in matters of religion. No truth, however sacred, can stand against it in the long run; and hence it is that in the Pagan world when our Lord came, the last traces of the religious knowledge of former times was all but disappearing from those portions of the world in which the intellect had been active, and had had a career.

'And in these latter days in like manner, outside the Catholic Church, things are tending with far greater rapidity than in that old time, from the circumstances of the age, to Atheism in one shape or another. What a scene, what a prospect does the whole of Europe present at this day! And not only Europe, but every government and every civilization through the world which is under the influence of the European mind. Specially, for it most concerns us, how sorrowful, in the view of religion, even taken in its most elementary, most attenuated form, is the spectacle presented to us by the educated intellect of England, France, and Germany! Lovers of their country and of their race, religious men external to the Catholic Church, have attempted various expedients to arrest fierce human nature in its onward course, and to bring it into subjection. The necessity of some form of religion for the interests of humanity has been generally acknowledged; but where was the concrete representative of things invisible, which would have the force and the toughness necessary to be a breakwater against the Deluge?

'Three centuries ago, the establishment of religion—material, legal, and social—was generally adopted as the true expedient for the purpose in those countries which separated from the Catholic Church, and for a long time it was successful; but now the crevices of those establishments are admitting the enemy. Thirty years ago[1] education was relied upon. Ten years ago there was a hope that wars would cease for ever, under the influence of commercial enterprise and the reign of the useful and fine arts. But will any one venture to say there is anything anywhere on this earth which will afford a fulcrum for us whereby to keep the earth from moving onwards?

'The judgment which experience passes on establishments, on education, as a means of maintaining religious truth in this anarchical world, must be extended even to Scripture, though Scripture be divine. Experience proves surely that the Bible does not answer a purpose for which it was never intended. It may be accidentally the means of the conversion of individuals; but a book, after all, cannot make a stand against the wild, living intellect of man; and in this it begins to testify, as regards its own structure and contents, to the power of that universal solvent which is so successfully acting upon religious establishments.

---

[1] This was written in 1865.

'Supposing, then, it to be the will of the Creator to interfere in human affairs, and to make provision for retaining in this world a knowledge of Himself, so definite and distinct as to be proof against the energy of human scepticism; in such a case—I am far from saying that there was no other way—but there is nothing to surprise the mind, if He should think fit to introduce a power into the world invested with the prerogative of infallibility in religious matters. Such a provision would be a direct, immediate, active, and prompt means of withstanding the difficulty; it would be an instrument suited to the need; and when I find that this is the very claim of the Catholic Church, not only do I feel no difficulty in admitting the idea, but there is a fitness in it which recommends it to my mind. And thus I am brought to speak of the Church's infallibility as a provision adapted by the mercy of the

Creator to preserve religion in the world; and to restrain that freedom of thought which of course in itself is one of the greatest of our natural gifts, and to rescue it from its own suicidal excesses. And let it be observed that neither here nor in what follows shall I have occasion to speak of the revealed body of truths, but only as they bear upon the defence of natural religion. I say that a power possessed of infallibility in religious teaching is happily adapted to be a working instrument in the course of human affairs for smiting hard and throwing back the immense energy of the aggressive intellect; and in saying this, as in the other things that I have to say, it must still be recollected that I am all along bearing in mind my main purpose, which is a defence of myself.'

It has been said that reason is the faculty which finds reasons for what we wish to believe, and the saying is true in so far as it implies that there are in every human being emotional and mental tendencies which suggest the premisses of arguments, dispose the lights and shadows in which external facts shall appear, and make conclusions appear to one person to be satisfactorily made out when to another they shall seem resting upon air. I believe that the passage which you have just read explains Newman's history. When he came to see the condition of the world into which he was thrown the aspect of it was unspeakably distressing. His whole efforts have been spent in finding a solution of the problem which would make existence on such terms less intolerable.

On the same broad ground on which Cardinal Newman places himself, I will shift the lights, and let the shadows fall the other way. Following his own analogy of the outcast boy, I will suppose a reasonable being with faculties limited like ours, with a belief in God like ours, but with no more immediate knowledge, suddenly introduced from another planet into our own earth, confronted with the phenomena which Cardinal Newman describes, and asked for an explanation of them, consistent with his religious conviction. Would such a being infer that the race which he was studying was implicated in some terrible aboriginal calamity? I do not see how the inference would help him. I think if he was wise he would feel his inability to give any explanation at all. But I suppose that before attempting the problem he would look into the past history of the earth, and into the various races of animated beings by which it was occupied.

He would see that man is only the highest of many varieties; that he is made on the same type as a large class of other animals; that as their bodies are a clumsy likeness of man's body, so their minds are a clumsy likeness of the mind. If he looked into the habits of these animals he would find no law among them but violence, no right but strength; no sign of disinterested affection, no object save the gratification of hunger or lust; the will and appetite of each creature only held in check by the will and appetite of other creatures more powerful; one generation exactly like another, with no capacity for looking forward, or accumulating knowledge and experience.

Turning next to man, he would observe, too, that he had the same animal nature. In many countries he would see that the habits of man were scarcely superior to those of the beings below him, that he was savage and ignorant as they, and that his progenitors from immemorial time had lived in the same way. Going back to the earliest traces of human life, the rude flint instruments, the cave-dwellings, and such other memorials as survive, he would infer that the primitive men everywhere had been as the savages are now, the nature which they shared with other animals entirely predominating; that not a vestige was to be found of any higher civilization which had once existed and had decayed; that the lower animals had come into being for many ages before man; that man himself had risen slowly from the animal's level to the position which he now occupies. Supposing then Cardinal Newman to have drawn a fair picture of the world as it stands at present, would the inquirer be likely to think that the human race was like a boy of whom its parents were ashamed? He would be unable to form the slightest idea why or how such a race had been created; but he would see that in addition to the qualities of other creatures men had capacities of memory, of moral sense and reason; that having been furnished with these capacities, they had been left to raise themselves by their own exertions; and that by fits and starts, sometimes springing forward, sometimes even seeming to recede, they had made their way to their existing state, a state falling far short of imaginary perfection, but far elevated also above the point from which they had set out; the defects only proving that the victory of the higher over the lower nature was still incomplete. He would see that man with all his faults had not only been able to acquire a knowledge of Nature, but had learned to rule the elements, to make the lightning carry his messages, and persuade

M. R. JAYAKAR
MALABAR HILL
BOMBAY

fire and water to bear him over sea and land; that he had learnt to rule his own appetites, to form notions of justice, to feel love and compassion, and indignation at wrong; that he had even raised his eyes to heaven, and had formed conceptions which had grown purer and more spiritual as his knowledge extended of his Maker's will and nature.

I am not the least pretending that this has been the actual history of man in this planet, but it is unquestionably the opinion which a stranger would form coming into it from without, and drawing his inferences from the facts which he would find. Far from thinking that the being whose nature he was studying was suffering from some fundamental calamity, he would conclude rather that man was in a state of discipline for the exercise of his powers, and slowly, through conscience and intellect, was rising to a knowledge of God. Man sins, it is true, and sin is an offence against God; but it is an offence only because the being capable of it has acquired a conception of a moral law. By the law sin entered; and the self-reproach of the sinner is the recognition of his obligations. The actions which are sinful in us are not sinful in themselves, but only in reference, as Butler says, to the nature of the agent. Murder and incest, robbery, cunning, rage, and jealousy are not sinful in animals. They tear each other in pieces, and we find from their anatomical structure that they were intended to do it. Man as an animal inherits the same dispositions; as an intellectual and moral being he has conquered them partially if not yet entirely, and so far from giving signs that he has fallen from any higher state, analogy and reason would rather suggest that he was on the way to a higher state.

This, I say, is the impression which an indifferent spectator would be at least as likely to form about mankind and their situation, as to think with Cardinal Newman that mankind are outcasts, that their intellect was their most dangerous enemy.

Leaving the spectator then, let me go on for myself. Cardinal Newman says that the intellect is naturally sceptical; that it destroyed the faith of the old world; that it is destroying still more rapidly the faith of modern society, and that religion can only be saved by some power which can smite the intellect back and humble it. Is this true? Is it not rather true that the intellect is the enemy only of falsehood? That if it keeps watch over religion, if it is jealous of novelties and unproved assertions, if it instinctively dreads lies, and lies in religion most of all because such lies are most mischievous, it is because experience has shown that without unceasing watchfulness religion degenerates into superstition, and that of the cankers which corrupt human character superstition is the worst.

Religious knowledge has grown like all other knowledge. Partial truths are revealed or discovered. They are thought to be whole truth, and are consecrated as eternal and complete. We learn better, we find that we were too hasty, and had mistaken our own imaginations for ascertained realities. 'No truth, however sacred,' Cardinal Newman says, 'can stand against the reason in the long run, and hence it is that in the pagan world, when our Lord came, the last traces of the religious knowledge of former times was all but disappearing from those portions of the world where the intellect was active and had had a career.' What is the fact? In the early stages of the Greek and Roman nations certain opinions had been formed about the gods; and certain religious services had been instituted. In these traditions there was much that was grand and beautiful; there was much also that was monstrous and incredible. As civilization developed itself both conscience and intellect protested and declared that the pagan theology could not be wholly true. If the Olympian gods existed, they were not beings whom it was possible to reverence; and the established creed having broken down, men were left face to face with nature, to learn from fact what the Divine administration of this world really was. They might be at a loss for an answer, and the grosser natures among them might be demoralized by absolute unbelief; but the difficulty itself had risen not from impiety but from piety. They had become too enlightened to attribute actions to the gods which they despised or condemned in one another. Was this scepticism? It was a scepticism then which was shared by the apostles, who called the heathen gods devils. As Tennyson says—

> There lies more faith in honest doubt,
> Believe me, than in half the creeds.

The unbelief in the Roman Empire, when our Lord came, was a *Præparatio Evangelica.* Great and good men disbelieved, not because they hated religion and wished to be rid of it, but because they would not call evil good, nor paradox a sacred mystery. The recognition that certain things were not true was the first step towards acceptance of what was true; and the ready hearing which Christianity met with proves the eagerness with which light was being looked for.

Horace is a typical Roman of the intellectual sort, an Epicurean, and an unbeliever in the established religion. Horace says—

> Dis te minorem quod geris, imperas.
> Hinc omne principium, huc refer exitum.
>   Di multa neglecti dederunt
>   Hesperiæ mala luctuosæ.

This is not the language of acquiescence in atheism. Christianity grew because the soil was ready prepared, because the intellect 'had had a career,' and had broken the back of superstition. The teachers of a new religion would have had but a short shrift in the days when Calchas could sacrifice Iphigenia. Special doctrines of the Christian faith had even begun to form independent of it. In Cæsar's time few cultivated men believed in a future life. Under the Antonines the most intellectual men of their age had come to believe it; and intellect had led them to the gate of the Christian Church. As it was in the first century so it had been in the sixteenth. Again the truth had been crusted over with fictions. Again the intellect rose in protest, and declared that incredibilities should not be taught any longer. But they cleared away the falsehood as they broke the painted windows in the churches, only that the clear light of heaven might shine the brighter. Even Cardinal

Newman himself has been, perhaps unwillingly, under the same influence. He professes horror at the thought of an auto-da-fè, and personally is unable to believe that such offerings could be approved of by such a being as he supposes God to be. But these 'acts of faith' were once regarded as righteous and necessary by the infallible authority which is to prevent us from thinking for ourselves.

The human intellect, I believe, will never voluntarily part with truth which has been once communicated. It hates lies, lies especially which come to it armed with terror in the place of argument. Possibly, in some instances, when it has found truth itself in bad company, its suspicions may have been roused without occasion. Falsehood, it has been said, is no match for truth, but it may be more than a match for truth and authority combined. Between men of intellect and priesthoods there has seldom been good agreement. Each regards the other as intruding upon his special domain. Priests and prophets went on ill together under the old dispensation. The prophet denounced the priest as a ritualist. The priest murdered the prophet with the help of popular superstition.

But Cardinal Newman tells us that intellect is unbelieving, that it needs to be smitten back and estranged from the world. He takes pity on its lost state by establishing in the Church a special representative of Himself. We know how it is with mankind generally, from the want of religion which appears in their conduct. If the Church is to show us how to live better, we may, we must, expect to find in the Church not a teacher only but an example, for if it be no better than the world, then we have the same reason for supposing God to be estranged from the Church. Cardinal Newman refers us especially to the condition of the countries which separated from Rome in the sixteenth century. Are the countries which remained in the Papal communion superior morally to those who left it? The bishops and priests had the education of France entirely in their hands after the Revocation of the Edict of Nantes. The result was the generation who made the Reign of Terror and abolished Christianity. Germany and England and America are not all which they ought to be; but is Catholic Ireland much better, or Catholic Spain? or Italy, which till a few years ago was more Catholic than either of them?

We have Church history, for now eighteen hundred years; or, if we choose to put it so, from the constitution of the Israelite nationality. What the Israelites were their own records testify. So far as conduct went they were like other nations. They had good kings and bad, good priests and bad, true prophets and false. They had their periods of idolatry. They had their periods of outward repentance and ceremonial punctiliousness. But when truth came among them, they had no special power of recognizing it, nor special will to welcome it. The heads of the Church rejected our Lord: the publicans and sinners received him. Of the ten lepers who were cleansed nine went to the priests: one only gave glory to God, and he was a Samaritan. The priest and Levite passed by the wounded man; the Samaritan had mercy on him. In Christian times the depositories of the infallibility which is to keep intellect in order have been the popes and bishops, speaking through their councils and acting through the ecclesiastical courts. When we look into the accounts of what these persons were, we find the same inequalities which are to be met with in all combinations of men, and in all human institutions; here, as elsewhere, we find saints and sinners: in one generation noble endeavours after holiness; in another worldliness, luxury, intrigue, ambition, tyranny, even ferocious cruelty. Unless Catholic writers have combined to calumniate their mistress, Rome was as venal under the popes as Jugurtha found her under the Republic; and the Church courts were a byword for iniquity in every country in Europe. The religious orders, which were founded expressly to exhibit a pattern of saintly life, became too corrupt to be allowed to continue in existence. When the printing-press was invented, and the Bible came to be read by the people, the contrast was so violent between religion as exhibited in the New Testament and religion as taught and exercised by the infallible Church that half Europe broke away from it. Cardinal Newman's theory implies that the Reformation was the rebellion of the intellect against the spiritual authority which was in charge of it. The authority must have done its work but ill if it had bred a generation of apostates. The Holy See when it found its power endangered behaved as ordinary human potentates behave on such occasions, and potentates not of the best kind. She filled Europe with wars. She stirred princes to massacre their subjects. The rack, the gibbet, and the stake were her instruments of persuasion as long as she had strength to use them. When her strength began to fail, she tried conspiracy and murder; and only now, in these later times, when the despised intellect has created a tribunal to which she is answerable in the public opinion of mankind, has she reformed her own manners and attempted to explain away her atrocities.

Well for her that these sad methods have been abandoned. Were the Church to treat but one man or woman in these days of ours as three centuries ago she treated tens of thousands, she would be rent in pieces by the common indignation of the entire human race. As it is she remains doing the work which is still appointed for her. But if an institution with such a history behind it is an exceptional instrument to bear witness to God's existence; if it be the voice through which alone He speaks to man, and makes known His nature and His will; then the attempt to understand this world, and what goes on in it, had better be abandoned in despair.

ORIGEN AND CELSUS.

WHEN the seed of the forest tree begins to germinate, and the cotyledons burst their ligaments and lift themselves into light, the growing plant thenceforward gathers its nutriment out of *the air.* The massive trunk of the oak which has stood for a thousand years, is composed chiefly of vapours absorbed through the leaves and organized into fibre by the cunning chemistry of nature. Some few mineral substances enter into its composition, and are taken up out of the soil through the roots. But these grosser elements are slight in comparison with those of more ethereal origin; how slight, may be measured by the handful of dust which remains when the log has been consumed in the furnace, and the carbon and hydrogen have returned to the source from whence they came. An animal is formed of the same materials, and is developed by analogous laws. A single cell with the force called life in it collects a congregation of gaseous atoms, and out of the atoms fashions a man. Men, again, are taken hold of by a further action of the living principle, and are formed into families and nations, societies and institutions; each held together by vital force, and dissolving when the force disappears. But all of them, individuals and nations alike, are made out of atoms lent to them for a while out of the aërial envelope of the globe, to be reclaimed after a brief incarnation. The smallest urn suffices to preserve such remnants of a man as cannot be decomposed into vapour.

Spiritual organizations are the counterpart of the material. Intellect and imagination are for ever scattering in millions the seeds of aspirations or speculations. From time to time some one out of these millions is 'brought to bear,' and becomes a theory of politics, a system of philosophy, a tradition, a poem, or a creed. The idea is the life; the organized form is assimilated out of the opinions and desires already floating in the minds of mankind. Some root in fact there may be. But the facts which can be seen, and handled, and verified by experience, are infinitesimally small. Accidental conditions may be needed to quicken an idea into an active force. But when once the idea has begun to grow, and organic tissue to be formed, the sole source of nourishment is again the spiritual—*air*.

It was once supposed that man was made of clay; that all things which had visible form and bulk were formed out of elements possessing a property of solidity; that air could not become solid, nor solids become air; and much illusory physiology was based on this hypothesis. There has been similar waste of labour and ingenuity in looking for historical facts as the basis of national traditions. The facts which we discover will not account for the consequences which seemed to grow of them. The Romans traced their Romulus to the gods; the modern popular historian regards Romulus as a robber shepherd; but he has still to explain whence the idea came which developed the shepherd's descendants into an imperial race; and when he looks for his reasons in the 'soil,' in the circumstances of their situation, he is like a man who would find the secret of the tree in its ashes, or would explain the lifting of the Himalayas by a force which would not elevate a mole-heap. The philosophy of history is gradually discerning that the amount of fact discoverable in early legends is extremely small, and that when discovered it is extremely unimportant. Legends are perceived to have risen out of the minds, and characters, and purposes of the people to whom they belong, and are only interesting as they show what those minds, and characters, and purposes were. In like manner, theological critics are throwing away valuable effort over the facts supposed to underlie the origin of Christianity. They forget the simile of the grain of mustard-seed to which the kingdom of heaven was compared by Christ himself; and they seek for the living in the dead. They sift the Gospel to separate the true from the false. They desire to ascertain precisely the events which occurred in Palestine eighteen or nineteen centuries ago; and such events as survive the process, and can be accepted after passing through the critical crucible, will be but ash or charred cinders. The truth, as it was, can never be discovered. The historical inquirer can look only through the eyes of the early Christian writers; and those writers neither saw as he sees, nor judged as he judges. The historical inquirer sees with the eye of reason; the early Christian saw with the eye of faith. The historical inquirer is impartial; the early Christian was enthusiastic and prepossessed. The historical inquirer demands evidence such as would satisfy a British jury in a criminal case; to the early Christian the life, and death, and resurrection of Christ were their own evidence, each detail of it the symbol of some spiritual reality, and every event of it intrinsically probable as it availed for the edification and elevation of the human soul. Thus the data do not exist to establish an evidential conclusion. The early Christians did not inquire, and therefore have left no record of inquiry. St. Paul was converted by a vision. The vision was sufficient for him, and he pointedly abstained from examining witnesses or strengthening his conviction by outward testimony. To us the ultimate fact is the existence of belief—belief created by such evidence as was convincing to the minds of the first converts. The evidence was sufficient for them, but they did not argue as we argue; their methods of inference were not our methods of inference; we can see only Christianity coming into existence as a living force; and, as of the oak tree, we do not ask, Is it true, or is it false? we ask, Is it alive? so with Christianity, we see a spiritual germ, quickened suddenly into active being, which grew and took possession of the human race, overthrowing every other force with which it came into collision, and eventually revolutionizing the entire character of human thought and energy. Life is not truth merely, but it is, as Plato says, *τὸ ἐπίκεινα τῆς ἀληθείας*, something above truth and more than truth; a force in visible operation which remains a mystery to the intellect; and it is immortal not as the properties of the circle are immortal, but as it propagates itself in eternal descent, body after body which it has animated successively perishing, but for ever reorganizing itself anew in fresh and developed forms. The individual oak tree grows old. Its functions become torpid. Its boughs clothe themselves more scantily with leaves. It ceases to expand. At length it decays and is resolved into the elements. But it has dropped its acorns from its branches, and in the acorn it lives again, in a new body, the essential qualities unchanged, the unessential and accidental passing away into other combinations. The Christianity of the first century was, and yet was not, the Christianity of the fourth century. The Christianity of the fourth century was, and yet was not, the Christianity of feudal Europe. The Christianity of feudal Europe died at the Reformation, and was born again in Protestant Christianity. Even things which we call dead are still subject to the eternal laws of change. Forces are for ever at work, integrating and disintegrating the atoms of which the inorganic world is composed. Only in the intellectual abstractions of geometry, or in numbers which have no existence save in the conceptions of the intellect do we find propositions of which we can predicate with certainty unalterable truth. Whatever has its being in time and space is under the conditions of transiency; but the transient is interpenetrated with life; every living thought which has quickened into vital organization, and has developed into flower and fruit, renews its energies while time endures; and, in the strictest sense of the words, the gates of death do not prevail against it.

Religion as a rule of life, neither is, nor can be, a record of events which once occurred on a corner of this planet. It is the expression and statement of our duties to one another, and of our relations to the Soverign Power which has called us into existence. And these duties and these relations are not conditions which once were or which will be hereafter. They are conditions of our present being, as much as what we call the laws of nature. For the laws of bodily health we are not dependent on the observations of Galen, or the history of the plague at Athens. We learn from present experience, as Galen himself learnt, and we refer to the records of the past only as a single chapter in the vast volume of our instructions. The evidence of the truth of religion is not the testimony of this or that person who saw, or thought he saw, long ago, something which seemed to him an indication of a supernatural presence. The evidence is the power which lies in a religion to cope with moral disease, to conquer and bind the brutal appetites and intellectual perversities of man, and to lift him out of grossness and self-indulgence into higher and nobler desires. This was what Christianity effected as no creed or system of philosophy ever did before or has done since, and Christianity was thus, as Goethe declares, beyond comparsion the grandest work which was ever accomplished by humanity. It is a height, he says, from which, having once risen to it, mankind can never again descend; and thus of all studies the most interesting to us is that of the conditions under which so extraordinary a force developed itself.

Within historical times the earth has never seen—let us hope it may never see again—such a condition of human society as prevailed in the Roman Empire during the centuries which elasped between the Crucifixion and the conversion of Constantine. When we look back over distant periods the landscape is foreshortened, and we discern but the elevated features of it. The long level intervals, where common life was the most busy, are lost to us almost entirely. We have the of questionable palace ladies, of intriguing favourites, and ambitious statesmen; we see the dagger, cord, or poison cup which removed prince after prince to make room for his successor with horrid uniformity. We read of invasions by barbarians, of fierce battles on the Danube, or the Euphrates, and the frontier advancing or receding. The units which form the sum of mankind we do not see; they are of small significance save to themselves and their families. In hundreds of millions they play their little parts upon the stage, and pass away and are forgotten because no one cares to notice or speak of them. Yet it is of these multitudes that humanity consists, and by the thoughts obscurely working in the minds of them the destinies of humanity are eventually controlled. In the centuries of which I speak ten generations of men were born and lived and died. The empire was sprinkled with cities, towns, villages, and farmsteads, all thronged like anthills, and in a fair state of outward civilization. Political discontent was rare and easily suppressed. Order was moderately maintained, and was disturbed only by occasional bands of robbers. Men of fortune resided on their estates, shot and hunted, went to the watering-places in hot weather, and kept their yachts. Merchants and manufacturers made money. Artisans and shopkeepers pursued their various trades. Peasants tilled their wheatfields or their vineyards. Schoolmasters or family tutors drilled the boys. State-paid professors taught in the universities. Philosophers wrangled. Priests presided in the shrines and temples, and held processions and celebrations on holydays. Peace, quiet, industry was everywhere, with an air of grace and harmonious culture; and below the surface was a condition of morality, at least among the educated classes, which words cannot describe or modern imagination realize. Moral good and moral evil were played with as fancies in the lecture-rooms; but they were fancies merely, with no bearing on life. The one practical belief was that pleasure was pleasant. By pleasure was meant the indulgence of the senses; and the supremest enjoyment which art and philosophy combined to recommend, was the most loathsome and unmentionable of vices. The poor may have been protected from the worst contamination by the necessities of hard work, the ignorant by the simplicity of their understanding. But so far as culture 'cast its shadow,' the very memory disappeared that there was any evil except bodily pain, or any good save in sensuality. The supreme deity led the way in impurity. The inferior divinities followed the example, which descended from them into the palace of the emperors. Adrian and Antinous were but another, and alas! more real, Zeus and Ganymede. The Stoics preached austerity; the Academics, virtue; the Platonists, the aspiration after the ideal. Stoics, Academics, Platonists were as vicious in practice as the pampered legionary who scoffed at their speculations. In the schools of Athens, where the most gifted youths in the Empire came to be educated in the worship of the beautiful, the professors illustrated their lessons by the practical corruption of their pupils. Freely as Lucian scattered his sarcasms over all classes of society except the lowest, he reserves his choicest arrows for the philosophers. Of all kinds of men who had fallen under the range of Lucian's eye, the philosophers were the worst. The nearest in infamy after them, and but a single degree better, were the priests and ministers of the established religion. Men of ability had longed ceased to believe in the Olympian gods. Men of ability, Epicureans all or most of them, believed in nature and natural laws. They believed in experience, they believed in what their senses told them—what lay beyond they regarded as a dream. But religion was still a convenient instrument to preserve the peace of the Empire. The majority of mankind were fools, and would continue fools. The belief in imaginary supernatural beings, who might reward or punish in another world, was a check on the passions of the strong, a consolation to the weak in their sufferings. Even if superstition was mischievous in itself it could not be eradicated. The accepted traditions therefore were preserved and treated with affected respect. The more outrageous features were softened into allegory. The new creeds and deities with which the spread of the Empire brought the Romans in contact were protected and patronized, and enthusiasm and religious excitement were allowed to play within reasonable limits. The mysteries of Ceres and Dionysus superseded the old temple worship. Serapis was admitted to equality with the Olympians. The Cæsars were taken into heaven and carried up their favourites with them. For the most part there was an outward show of decency, but the creed was a conscious imposture. The ceremonial became infected more and more with the general impurity, and the Mysteries, which perhaps originally arose from a desire for something purer and better, became a veil at last for the most detestable orgies. When

Adrian's 'favourite' Antinous died, the Egyptians built a town and shrine in his honour, and Antinopolis became a scene of miracles as constant as those at Lourdes. At this point religion had perhaps reached its nadir—lower than this it has never descended upon earth. The degradation was now as complete as the genius of evil could make it. The shocked conscience of mankind, never wholly extinct, was already kindling into resentment; and as in political catastrophes revolution is nearest when tyranny is at its worst, so in moral putrefaction the germs are quickening of a new order of things. There is this difference only, that the overthrow of a government is swift and sudden; the regeneration of character is slow and deliberate. Political convictions disappoint expectation. The enthusiasm of revolt is a conflagration which expires when the fuel is consumed. A religious revolution advances steadily in the hearts of mankind, and each step that is gained is a conquest finally achieved. Lucian was able to see that some vast religious change was approaching; but Lucian could not discern the direction from which it was coming. Christianity was working in a sphere too low for him. Spiritual regeneration begins naturally among the poor and the humble, for it begins in the strata of society which are least corrupt. First individuals a found intent on reforming their own wretched lives, with no thought of converting the world. Individuals gather circles about them. The circles spread and lay down rules for themselves and simple formulas of doctrine. The material lies scattered everywhere ready to organize. The supreme idea which can assimilate it is found at last, but not immediately. There are false starts: spurious seed is sown with the good, and springs up as weeds. Tentatively, gradually, and after severe competition, the fittest survives.

From the moment of the final conquest of Asia by the Romans, when the Asiatic and European philosophers were brought in contact, an intellectual fermentation had been active. Theosophic theories were formed in infinite variety, some fanciful and withering in a season; some strong, like Manicheism, and protracting a vigorous existence for centuries. Enthusiasts, impostors, prophets started up, 'boasting themselves to be somebody.' Enchanters, magicians, necromancers, dealers with spirits were everywhere making fame and fortune out of sick souls pining for knowledge of the invisible world. The most illustrious of these Cagliostros of the old world, Apollonius of Tyana and Alexander of Abonitichus, blazed into a splendour which shone over the whole Empire.

Into the midst of this strange scene of imposture, profligacy, enthusiasm, and craving for light, Christianity emerged out of Palestine with its message of lofty humility. The quack prophets claimed to be gods or sons of God. They carried their credentials with them in the form of pomp and power. They worked miracles, they invited fools to worship them, and in return they promised the faithful infinite rewards of gold and pleasure. The teachers of Christianity called themselves also apostles of a son of God; but their Son of God was a village carpenter, who had lived in sorrow and had died on the cross, and their message was a message never heard before on earth. It was to invite their fellow-men to lead new lives, to put away sin, to separate themselves from the abominations of the world, to care nothing for wealth and to be content with poverty, to aim only at overcoming, each for himself, his own sensuality and selfishness; to welcome pain, want, disease, everything which the world most shrank from, if it would assist him in self-conquest, and to expect no reward, at least in this life, save the peace which would arise from the consciousness that he was doing what God had commanded.

Such a message naturally found readiest acceptance among those whom ignorance had protected from philosophy; who had lived in hardship, and had been least enervated by what was called pleasure. Rich men could not easily abandon substantial enjoyments in pursuit of so imaginary an object as the elevation of their characters. Men of intellect had heard too much of sons of God, and had seen too many of them, to attach significance to the alleged appearance of another in Judæa.

The early Christian converts were those who had little to part with, whose experiences of life were hard already, and who found the hardness of their lot made more bearable by the knowledge that want and sorrow were no evils, and might be actually good for them. Intellectually they were called on to believe nothing which in itself was difficult. Such men knew nothing of science or of laws of nature. The world as they knew it was a world already full of signs and wonders. There was nothing wonderful in the coming to earth of a Son of God, for the Jews had been told to expect Him; and the Gentiles believed that He had come in the person of Augustus Cæsar. A miracle was as little improbable in itself as any other event. The heroes had risen from the dead, and ascended into heaven, and were seen as stars nightly in the believed, was that the spirits with whose operations they had been hitherto familiar, were evil or mischievous spirits, or spirits at best indifferent to good. In the new revelation the spirits of God were seen taking part in the direction of human affairs, and defeating the powers of darkness in their own world. Thus the doctrine announced was precisely of the kind which the hearers were prepared to receive; and it was preached in perfect good faith, because the teachers were on the same intellectual level with their audience. They were men of noble natural disposition, natural gifts, natural purity of mind, but they were unlearned. They knew nothing of science or art, and with the exception of St. Paul, nothing of literature, nothing of politics, nothing of the world around them. St. Paul had been well educated, yet his scientific knowledge had been carried only far enough to betray him into error, when he illustrated the resurrection of the body from the growth of a grain of wheat, which he supposed to die and rise again. Contemporary naturalists were as well aware then as now, that if the grain was dead it would not rise again.

In its earliest stages the Church absorbed the common superstitions of its day; as converts multiplied, the circle of its horizon widened, and it gathered into itself and remodelled after its own likeness the prevailing speculations of the times and the prevailing practices. The birth of Christ was fixed at the winter solstice, when already a universal festival was held for the birth of the sun and the beginning of the new year. In place of the heathen mysteries there were the Christian mysteries of the Sacraments. Philosophers said that the root of evil lay in matter; that the appetites which led to sin were affections of the flesh, which lusted against the spirit. Christianity accepted the theory, explained the fact by Adam's fall, and found a remedy in the virgin-born body of Christ, which, being generated free from the effects of Adam's sin, resumed its purity, became the mystical body of the Church, and the food, through transubstantiation, of the believer. The Trinity was taken over from the Platonists, who had already shaped it into form. A strange and painful opinion had spread out of Phœnicia over the Greek and Roman world, that the gods required, as a condition of any special favour, the sacrifice of some pure and innocent human victim. This dark belief had been the growth of comparatively recent centuries, but it was laying hold on the popular mind with increasing fascination. It could not be eradicated, and it was reconciled to the conscience in the doctrine of the Christian atonement. Every popular idea, every speculation floating in the spiritual sky, was thus successively seized, and, like a cloud reversed, was transformed into an image of beauty. The chambers of the mind were not remodelled, but for each impure or frightful occupant, some new inmate, some pure and elevating spiritual symbol, was substituted, intellectually analogous, and every function of human nature—heart, conscience, reason, imagination—was gradually enlisted in the war against moral evil.

The ages differ one from another: the believing and the scientific eras succeed each other as systole and diastole in the progress of human development. In believing eras, nations form themselves on heroic traditions. Legends shape themselves into poetry, and aspirations after beauty and goodness bloom out into art and religion. Scientific eras bring us back to reality and careful knowledge of facts; but scepticism is fatal to the enthusiasm which produces saints, and poets, and heroes. There would have been no 'Iliad' in an age which inquired into the evidence for the real existence of Priam or Achilles. There are two kinds of truth: there is the general truth, the truth of the idea, which forms the truth of poetry; there is the literal truth of fact, which is the truth of science and history. They correspond to opposite tendencies in human nature, and never as yet have been found to thrive together.

Without inquiry, without hesitation, by force of natural affinity, Christianity grew and spread over the Empire, and as surely there went with it and flowed out of it a complete revolution in the relative estimate of the value of human things. To a Roman or a Greek the greatest of evils had been pain; to the Christian the greatest of evils was sin. The gods of Paganism were called blessed, and were said to be perfectly happy; but they were happy because they were unrestrained and could do whatever they pleased. The God of Christianity was absolute perfection, and perfection meant perfect obedience to law. From the lowest fibre of its roots, the nature of a Christian—heart, intellect, imagination—underwent a complete transformation, a transformation which, if real, no intelligent person could deny to be a change from a worse condition to a better; and it might have been expected that the Roman emperors would have given a warm welcome to the power which was effecting such an alteration, if on no enmity to Christianity a characteristic of the best emperors, not of the worst? Why do we find the darkest persecution in the reign, not of a Domitian or a Commodus, but under the mild, just rule of a Trajan, a Marcus Aurelius, a Severus, or a Diocletian?

No more valuable addition could be made to theological history than an account of the impression made by Christianity on the minds of cultivated Romans of the highest order of ability, while its message was still new, before long acceptance had made its strangest features familiar, and before the powers which it eventually exerted commanded attention and respect. Few such men, unfortunately, condescended to examine its nature with serious care. Tacitus, Pliny, Lucian, glanced at the Christians with contemptuous pity, as victims of one more of the unaccountable illusions to which mankind were subject. They were confounded at first with the Jews; and the Jews, as the Romans had found to their cost, were troublesome fanatics whom it was equally difficult to govern or destroy. When the political constitution of a nation is abolished, its lands taken from it and its people scattered, the atoms are usually absorbed into other combinations, and the nation ceases to exist. The Romans made an end of Jerusalem; they levelled the Temple with the ground; so far as force could do it, they annihilated the Jewish nationality. They were no nearer their end than when they began. The bond of coherence was not political but religious, and the Jewish communities dispersed throughout the Empire burst occasionally into furious insurrections, and were a constant subject of anxiety and alarm. The Jews proper, however, were relatively few; they made no proselytes, and could be controlled; but there had come out from them a sect which was spreading independent of local associations, making converts in every part of the world. If not Jews, they were wonderfully like Jews; a proselytizing religion was a new phenomenon; and in an empire so little homogeneous as the Roman an independent organization of any kind was an object of suspicion when it grew large enough to be observed. The Christians, too, were bad citizens, refusing public employment and avoiding service in the army; and while they claimed toleration for their own creed, they had no toleration for others; every god but their own they openly called a devil, and so long as religion was maintained by the State, and the Empire was administered with religious forms, direct insults to the gods could not readily be permitted. Their organization was secret, and their allegiance ambiguous, since they refused to take the customary oaths; while doubtless to intelligent men, who were looking to the growth of accurate scientific knowledge for the amelioration of mankind, the appearance of a new and vigorous superstition was provoking and disappointing. All this we see, yet it still leaves much unexplained. It fails to show us the motives which led Marcus Aurelius to persecute men whom his own principles must have compelled him to admire. Some further insight may be gained, however, from the fragments of a once celebrated work called 'A True Account,' which have been preserved by Origen in his answer to it. The author of this work is believed to be a distinguished Roman named Celsus, Marcus Aurelius's contemporary. The book itself is lost. Nothing remains of it save the passages which Origen extracted that he might refute them; and thus we have no complete account of what Celsus said. We have, like the geologist, to restore an extinct organization out of the fossils of an imperfect skeleton. But the attempt is worth making. The remains of this lost production exhibit most curiously the relations of the Christianity of the second century to the intellectual culture of the time, and the causes, neither few nor insignificant, which prevented men of high character and attainments from embracing or approving it.

Of Celsus personally not much is known. He was an Epicurean in opinion and belief; but the habits of men were not governed by their philosophy, nor did the name bear at that time the meaning which now attaches to it. The Epicurean under Marcus Aurelius was the man of science, and of Celsus we gather generally that he was a clear-sighted, honest, proud, and powerful-minded man, unlikely to concern himself with vice and folly. His method of thought was scientific in the strictest modern sense. He disbelieved evidently that the order of nature was ever interrupted by supernatural interference. He had assured himself that every phenomenon in the moral or material world was the sequel of a natural cause. Epicurius had taught him that constant unvarying laws, or groups of laws, prevailed throughout the universe, that what appeared to be chance was only the action of forces not yet known to us, and that every alleged miracle performed either by God, angel, devil, or art magic, was a false interpretation of some natural phenomenon, misinterpreted by ignorance or misrepresented by imposture. He considered that human affairs could be best ordered by attention and obedience to the teaching of observed facts, and that superstition, however accredited by honourable objects or apparent good effects, could only be mischievous in the long run. Sorcerers, charlatans, enthusiasts, were rising thick on all sides, pretending a mission from the invisible world. Of such men and such messages Celsus and his friends were inexorable antagonists. The efforts of their lives were directed to saving mankind from becoming the victims of a new cycle of folly. He himself had written an elaborate treatise, which has been lost, like his other writings, against the Eastern magicians. Lucian dedicated to him his exposure of Alexander of Abonitichus, the most impudent and the most successful of the enchanters of the second century. 'This sketch,' says Lucian, in the closing lines, 'I have determined to address to you, my dear sir, both to give you pleasure as a person whom I hold in especial honour for the wisdom, truthfulness, gentleness, justice, composure, and uprightness, which you have displayed in your general conduct, and, again, which I think will gratify you even more, in vindication of our master, Epicurus, who was a saint indeed; who was inspired in the highest sense; who alone combined, and taught others to combine, the good with the true, and was thus the deliverer and the saviour of those who would consent to learn from him.'

In this spirit Celsus composed his ἀληθὴς λόγος, his 'True Account,' against the Christians, in connection, apparently, from the political character of its concluding passages, with the efforts of Marcus Aurelius to suppress them. The book was powerful and popular, and it proved a real obstacle to the spread of Christianity among the educated classes. Eighty years[1] at least after its publication the Church found it necessary to reply, and Origen, the most gifted and accomplished of the Christian fathers, was selected for the task. Origen's answer decided the controversy in the Church's favour; but in the reconsideration of the theological position which has been forced upon the modern world, what Celsus had to say has become of peculiar interest to us, and I have endeavoured to reconstruct, in outline, his principal positions. His arguments lie under every disadvantage; the order is disarranged; the objections are presented sometimes in his own words, sometimes in paraphrases and epitomes, and are brought forward in the attitude in which they could be most easily overthrown. Often we are left to discover what he must have said from the details of the rejoinder. His antagonist was totally without humour, and when Celsus was speaking in irony or condescending to prevailing weaknesses, Origen supposed him to be giving his serious opinion; and again, a mind intensely earnest and religious is unfitted by its very nature to comprehend scientific modes of thought. Yet Origen was too high a man to condescend to wilful misrepresentation, or to do less than his very best to exhibit faithfully the lines which he assailed. Notwithstanding these inevitable drawbacks, a fair conception can still be formed of the once celebrated 'True Account.'

---

[1] That is, if the opinion generally received is correct, that the Celsus who composed the ἀληθὴς λόγος was Lucian's friend. But the evidence is not entirely conclusive.

The writer of it commences, or seems to commence, by saying that he does not condemn the Christians for the secrecy of their rites or for their barbarous origin. Secrecy was forced on them by their position, and a foreign extraction was not in itself a crime. There was nothing censurable in their lives or habits, or in their refusal to worship statues made by human artists, or to believe the legends of the Grecian gods. Their fault was that they had erected a new superstition of their own, which they maintained by the arts of common charlatans. A belief, Celsus admitted, was not to be abandoned because the profession of it was dangerous. A man with a *soul* in him longed necessarily for the truth, loved God above all things, and desired only to know what God was and what God willed. But he must take his intellect along with him, or he might fall into folly and extravagance; and Celsus complained that the Christians would neither reason nor listen to reason. 'Inquire nothing,' they said. 'Believe, and your faith will save you. The world's wisdom is evil, and the world's foolishness is insight.'

Their origin, according to Celsus, was tolerably well known. There were certain traditions common to all nations respecting the creation of the world. These traditions Moses became acquainted with in Egypt. Moses, who was probably a magician, introduced into them variations of his own. From Egypt he borrowed various religious rites. A number of shepherds took him for their leader, and, under his guidance, they professed a belief in one God, whom they called 'the Most High,' or Adonai, or God of Sabaoth, or of Heaven. By these names they meant the Universe, or what the Greeks called τὸν ἐπὶ πᾶσι Θεόν, the God over all. Hence came the Jewish nation, and from among them, now in these late years, there had risen a second prophet, who was called 'the Son of God.'

The majority of the Jews themselves had not admitted the pretensions of the new claimant, and to explain the reason of their refusal Celsus introduces an orthodox Jew, whom he represents as thus addressing Christ:—

'You were born in a small Jewish village. Your mother was a poor woman who earned her bread by spinning. Her husband divorced her for adultery You were born in secret and were afterwards carried to Egypt, and were bred up among the Egyptian conjurers. The arts which you there learnt, you practised when you returned to your own people, and you thus persuaded them that you were God. It was given out that you were born of a virgin. Your real father was a soldier, named Panther.[1] The story of your Divine parentage is like the story of Danaë. You say that when you were baptized in Jordan a dove descended upon you, and that a voice was heard from heaven declaring that you were the

---

[1] Epiphanius says that Joseph's father was called Panther. John of Damascus says that Panther was Mary's grandfather. The Talmud says that he was Mary's husband.

Son of God. Who saw the dove? Who heard the voice, except you and another who suffered as you suffered? The prophets have foretold that a Son of God is to come. Granted. But how are we to know that they referred to you? They spoke of a glorious king who was to reign over the world. You we know only as wandering about with publicans and boatmen of abandoned character.[1] You tell us that the wise men of the East came at your birth to adore you;[2] that they gave notice to Herod, and that Herod killed all the children in Bethlehem, to prevent you from becoming king. You yourself escaped by going to Egypt. Is this story true? and if it be, could not the angels who had been busy about your birth have protected you at home? When you grew up, what did you accomplish remarkable? What did you say? We challenged you in the Temple to give us a sign as your credential. You had none to give. You cured diseases, it is said; you restored dead bodies to life;

---

[1] Origen thinks that Celsus must have gathered this from an Epistle of Barnabas, where the Apostles are spoken of as *ὑπὲρ πᾶσαν ἁμαρτίαν ἀνομώτεροι.*

[2] Origen says the wise men were magicians. Their power depended on some spirit or spirits. It ceased suddenly when Christ was born, and they thus knew that something wonderful had happened.

you fed multitudes with a few loaves. These are the common tricks of the Egyptian wizards, which you may see performed every day in our markets for a few halfpence. They, too, drive out devils, heal sicknesses, call up the souls of the dead, provide suppers and tables covered with dishes, and make things seem what they are not. We do not call these wizards sons of God; we call them rogues and vagabonds.'

The Jew then turns to his converted countrymen.

'What madness can have possessed you,' he says, 'to leave the law of your fathers? Can you conceive that we, who were looking for the coming of the Messiah, should not have recognized him had this been he? His own followers even were not convinced, or they would not have betrayed and deserted him. If he could not persuade those who daily saw and spoke with him, shall he convince you now that he is gone? He suffered, you pretend, to destroy the power of evil. Have there been no other sufferers? Was he the only one? He worked miracles, you say, he healed the lame and the blind, he brought the dead to life. But, oh light and truth, did he not himself tell you, is it not written in your own books, that miracles could be worked by impostors? He calls

Satan a master of such arts, so that he admits himself that they are no evidence of divine action. Are you to argue from the same works that one man is God, and another a servant of Satan? Why is one a servant of Satan more than the other? To what can you appeal? You say he prophesied that he would himself rise from the dead, and he did rise. The same is said of many besides him. Zamolxis told the Scythians that he had come back from the dead. So Pythagoras told the Italians. Rhampsinitus pretended to have played dice with Ceres in Hell, and he showed a golden handkerchief which Ceres had given to him. Orpheus, Protesilaus, Hercules, Theseus, all are said to have died and risen again. But did any one ever really rise?—really?—in the body in which he had lived? Or shall we say that all these stories are fables, but that yours is true? Who saw your prophet after he rose? an hysterical woman or some of his own companions who dreamt of him or were deluded by their enthusiasm. All the world were witnesses of his death. Why were none but his friends witnesses of his resurrection? Had he desired to prove that he was God, he should have appeared to his accusers and his judge, or he should have vanished from the cross. We hope that we shall rise again in our bodies and have eternal life, that he will be a guide and example in the resurrection, and that one who is to come will prove that with God nothing is impossible. Where is your prophet now? that we may see and believe. Did he come among us that we might reject him? He was a man—such a man as truth shows him to have been and common sense declares.'

So far the Jew; but after all, says Celsus, now speaking in his own person, the controversy between Jews and Christians is but for the proverbial 'ass's shadow;' for both agree that the human race is to be redeemed by a Saviour from heaven; the only question between them is about the person of this Saviour.

The Jews were a tribe of Egyptians who revolted from the established religion. The Christians have revolted in turn from them, and the cause in both cases has been the same—a seditious and revolutionary temper. So long as the Christians were few there was tolerable agreement among them. As their numbers extended the mutinous spirit displayed itself. Sect has formed after sect, each condemning the other, till they have little left but the name in common. Their faith rests on nothing but their hopes and fears, and they have invented the most extraordinary terrors. God forbid that they, or I, or any man, should cease to believe that wicked men will be punished hereafter and good men rewarded.[1] But the Christians have taken this ancient doctrine, and distorted its meaning, and now howl it out like the Corybantes, as if no one had ever heard of it before. Their creed preserves its original Egyptian stamp—grand and impressive without, and within ridiculous. The Greeks say that the heroes became gods. The Christians will not believe in the heroes, but insist that Christ was seen after death by his friends when they saw nothing but a shadow, and they are angry with us if we in turn decline to believe them. Hundreds of Greeks are to be found to this day who maintain that they have seen, and often see, Esculapius busy about sick beds. Aristeas of Proconnesus disappeared mysteriously again and again, and started up in all quarters of the world. Abaris travelled on an arrow. Hermotimus of Clazomenæ could leave his body and return to it. Cleomedes was locked into a box, and when the box was opened he was gone. Men once living and now deified have their temples everywhere. There are the Emperor Adrian's lovers. Antinous works miracles daily at Antinopolis. These we are to call fables; yet what we are told of Jesus we are expected to believe. Those only can believe it who have determined that it shall be regarded as true, and forbid inquiry and investigation. The Christian teachers have no power over men of education, over men of knowledge and learning. They do not address themselves to intelligence, they call human wisdom folly. The qualifications for conversion are ignorance and childish timidity. They are like the orators who gather crowds about them in the market-places; but you see no sensible person there; you see only boys and slaves and the common materials of a city mob. Weavers or cobblers will make their way into private houses; so long as the heads of the family are present, they say nothing; when they have the field to themselves, they catch hold of the children and women, and then produce their marvels. Fathers and tutors are not listened to. Fathers and tutors, they say, are mad or blind, unable to understand or do any good thing, given over to vain imaginations. The weavers and cobblers only are wise, they only have the secret of life, they only can show the way to peace and happiness. If father and tutor come back and find them there, the more timid cease their instructions. Those who are bolder advise the children to defy their parents. They whisper that till they are alone they can teach them no more. They slink away with them into the women's apartment, or bid them come and learn the ways of perfection in their own workshops.

---

[1] A very remarkable confession, considering who made it—so remarkable that it must be given in Celsus's own words: *μήτε τούτοις εἴη μήτ' ἐμο μήτ' ἄλλῳ τινὶ ἀνθρώπων ἀπόθεσθαι τὸ περὶ τοῦ κολασθήσεσθαι τοὺς ἀδίκους κα γερῶν ἀξιωθήσεσθαι τοὺς δικαίους δόγμα.* (Lib. iii. c. 16.)

I speak bitterly about this, says Celsus, because I feel bitterly. When we are invited to the Mysteries, the masters use another tone. They say, 'Come to us, ye who are of clean hands and pure speech, ye who are unstained by crime, ye who have a good conscience towards God, ye who have done justly and lived uprightly.' The Christians say, 'Come to us, ye who are sinners, ye who are fools or children, ye who are miserable, and ye shall enter into the kingdom of heaven.' The rogue, the thief, the burglar, the poisoner, the spoiler of temples and tombs, these are their proselytes. Christ, they say, was sent to save sinners; was he not sent to help those who have kept themselves free from sin? They pretend that God will save the unjust man if he repents and humbles himself. The just man, who has held steady from the cradle in the ways of virtue, He will not look upon. We are to confess ourselves to be sinners, and to pray and sob for pardon. The magistrate judges by the truth, he does not listen to tears and lamentations. Can God require such attitudes? Are we to think of God as a being who can be softened by appeals to his pity? Why are sinners to have the preference with Him? When persons with a proclivity to evil have formed evil habits, they are notoriously past cure; neither punishment nor tenderness will mend them. Surely those who are doing the best for themselves are those who best deserve help from above. It is pretended that well-conducted people are led astray by self-conceit, and will not listen to reproof. But the Christians do not address the well-conducted. They address the ignorance of the multitude; they are like the drunkards who accuse the sober of being drunk, or the half-blind who tell those with eyes that they cannot see. They are leading astray miserable men after visionary hopes, and turning them from the knowledge of all that is really good.

You say, Celsus goes on as if personally addressing the converts, that God must come down to earth to judge mankind. The Jews say, that He will come. The Christians, that He has come already. But why should God come down? To learn what mankind are doing? He already knows all things. Was it to set right what was amiss? The everlasting order of the universe does not need to be set right. No link of it is broken or can be broken. Or perhaps you think that He was without his due honour; that He desired to learn who there were that believed in Him; that He would have us know Him for our salvation, that those who would turn to Him might repent and be saved, and those who rejected Him might be convicted of an evil heart. Do you suppose that for all these ages God had left man alone, and only now at last has remembered and visited him? You tell us nothing of God with any savour of truth in it. You terrify fools by pictures of the horrors which await the impenitent, pictures like the spectres and phantasms which we are shown in the Mysteries.

You have gathered a doctrine out of the Greek legends which you have not understood about cataclysms and conflagrations. The Greeks discovered that elemental catastrophes might be looked for in recurring cycles. The last deluge was Deucalion's: now you think that it is the turn of fire, and that God will come upon the earth as a consuming flame. God, my friends, is all-perfect and all-blessed. If He leaves his present state, and comes down as a man among men, He must pass from blessedness to unblessedness, from perfection to imperfection, from good to bad, and no such change is possible with Him. Change is the condition of mortality. The immortal remains the same for ever. He cannot change without ceasing to be Himself. He cannot seem to change while He remains unchanged, for then He is a deceiver. You Jews say that when the world is full of vice and violence, God must send his angels and destroy it as He did in the first Deluge. You Christians say, that the Son of God was sent on account of the Jews' sins: that the Jews crucified Him, and incurred heavier wrath than before. You are like so many ants creeping out of their anthill, or frogs sitting round a pond, or a congregation of worms on a mud-heap, discussing among themselves which have sinned, and all claiming to have had the secrets of God revealed to them. For us, they say, He has left the circuit of the sky. Our interests only He considers, forgetting all other created things: to us He sends messenger after messenger, and thinks only how to attach us to Himself: we are God's children, and are made in his likeness: for us earth, water, air, and stars were created, to be our ministers: but some of us have sinned, and now God must come, or send his Son, to burn up the offenders, and give the rest of us frogs eternal life. Such language would be less monstrous from the frogs than from those who now use it. What are the Jews that they claim so lofty privileges? They were a colony of revolted Egyptian slaves who settled in a corner of Palestine. In their account of themselves they pretend that at the beginning God made a man with his hands, and breathed life into him. He then put him to sleep, took out one of his ribs, and of the rib made a woman. Having thus created these two, He gave them certain orders, which the serpent tempted them to disobey, and thus crossed God's purpose and got the better of Him. God having thus failed to make his creatures loyal to Himself, after a time proposed to destroy them. There was a Deluge, and a marvellous ark, in which all kinds of living things were enclosed, with a dove and a raven to act as messengers.[1] The history of the Patriarchs follows—children singularly born; brothers quarrelling; mothers plotting; a youth cheating his father-in-law; a story of Lot and his daughters worse than the banquet of Thyestes. One of the lads goes to

---

[1] The difficulty of conceiving that such a multitude of creatures could have been preserved in a vessel of the dimensions usually assigned to the Ark, was a very old one. Origen gets over it by saying that the figures were wrongly given. The Ark, he says, was 90,000 cubits long, and 2,500 cubits wide.

Egypt, where he interprets a dream, and becomes ruler of the country. His family join him and settle there. The Jews and Christians explain these legends into allegory, but it is all illusion together. God makes nothing which is liable to death. The soul of man is God's work. The body of man is not his work. The human body differs nothing from the body of a bat or a worm. It is made of the same materials. It comes to the same end; all material things are mortal, and subject to decay. The evil which men speak of is a necessary condition of the universe. It is not in God; it is in matter; its energy lies in corruption; and life and death succeed each other with an unchanging law of uniform succession. The world was not made for man. Each organized creature is born and perishes for the sake of the whole *κόσμος*. That which to you seems evil may not be evil in itself. To some other being, or to the universe, it may possibly be good. Man refers all things to himself and his own interests; but the rain from heaven was no more sent for him than it was sent for the trees and herbs. The trees and herbs are of as much benefit to the animals as to man. The animals might even with better reason regard themselves as the special objects of

God's care. Man seeks his food with pain and toil. The animals neither sow nor plough; the earth supplies them freely with all that they need. Euripides may say:

> The day and night are ministers of man.

Why more of man than of ants and gnats, to whom night brings sleep, and day the return of energy? Are we lords of the animals because we capture and devour them? Do not they equally chase and devour us? And we must use nets and weapons and hounds and huntsmen, while nature has given weapons to them sufficient with no such assistance. So far as nature goes it might be rather said that God had subjected man to beasts. Will a higher place be claimed for man because he lives in cities and rules himself by laws? So do ants and bees. They too have their chiefs, their wars, their victories, their captured enemies; they have their towns and suburbs, their division of labour, their punishment for drones: they have cemeteries for their dead: they converse and reason when they meet on the road. To one looking down from heaven no such mighty difference would appear between the doings of men and the doings of ants. The universe was no more made for man than for the lion, the eagle, or the dolphin. One created being is not better in itself than another. All are but parts of one great and perfect whole, and this whole is the constant care of the providence of God. He does not forget it and turn to it at intervals when it has become corrupt. He is not angry with it nor threatens to destroy it on man's account any more than on account of apes and flies. Each thing in its place fulfils its allotted work.

No God or Son of God has ever come down to this earth or will come. The Jews profess to venerate the heavens and the inhabitants of the heavens; but the grandest, the most sublime, of the wonders of those high regions they will not venerate. They adore the phantasms of the dark, the obscure visions of their sleep; but for those bright and shining harbingers of good, those ministers by whom the winter rains and the summer warmth, the clouds and the lightnings and the thunders, the fruits of the earth and all living things are generated and preserved, those beings in whom God reveals his presence to us, those fair celestial heralds, those angels which are angels indeed, for them they care not, they heed them not. They dream of a God who will burn all created things to cinders, and will raise up them to life again in their fleshly bodies.

It is not to gratify such appetites of disordered minds that God presides in this universe. He rules in justice and uprightness. To the soul He may grant immortality. The flesh is but a perishing excrement which He neither will save nor, though you say that with Him nothing is impossible, is able to save, for He is Himself the reason of all things, and He cannot contradict his own nature.

The Jews as a separate nation have their own institutions and their own religion, and the Government does not interfere with them. Different peoples have each their special modes of thought and action, and it is good to preserve a community in the form in which it has grown. It may be too that the earth from the beginning has been partitioned into spiritual prefectures, each under a viceroy of its own, and that each province prospers best when left to its own ruler. National laws and customs are of infinite variety, and each nation prefers its own. If in this spirit the Jews are tenacious of their traditions, they are not to be blamed; but if they pretend to the possession of special secrets of knowledge, and refuse, as unclean, a communion with the rest of mankind, they must be taught that their own dogmas are not peculiar to them. They worship the God of heaven; the

Persians sacrifice on the hill-tops to *Dis*, by whom they mean the circle of the sky; and it matters little whether we name this Being *Dis* or 'the Most High,' or 'Zeus,' or 'Adonai,' or 'Sabaoth,' or 'Ammon,' or with the Scythians 'Papa.' The Egyptians and the Colchi were circumcised before the Jews; the Egyptians do not eat swine's flesh, nor the flesh of many animals beside; the Pythagoreans touch none. As to outward signs that God has any special care for the Jews, what has become of them? Not knowing the truth and enchanted by vain illusions, they have been swept away out of their country and bear the penalty of their arrogance.

Allow that the Christians' master may have been some angel: was he the first or the only angel that has come into the world? The Christians themselves tell of many more who, they say, rebelled and are confined in chains in the hollow of the earth, and they pretend that the hot springs are their tears. Some of them imagine that the Demiurgus, or Creator, was not the Father of Christ, and that Christ came to bring men from the Demiurgus to his Father. There are the Simonians among them who worship Helen or her master Helenus. Others derive themselves from Marcellina, others from

Salome, others from Mariamne, or from Martha. And there are, again, the Marcionites. Some of these sects prostrate themselves in darkness before imagined demons with rites more abominable than the orgies in the College of Antinous; they curse each other with horrid imprecations, and will yield no point for concord; yet, amidst their mutual reproaches, they all sing to the one note, 'The world is crucified to me, and I to the world;' 'If you will be saved, believe, or else depart from us.' Who is to decide among them? Are those who would be saved to throw dice to learn to whom to attach themselves? Again, there are the Ophiatæ, or serpent worshippers—a tree of knowledge, with the serpent for the good spirit, and with the Demiurgus for the evil spirit. There are the prophetic oracles, circles within circles, water flowing from the Church on earth, virtues distilled from the Prunic Virgin,[1] the soul living, the sky slain that it might live again, the earth stabbed with an altar knife, human beings sacrificed and restored, death ceasing out of the universe when sin shall die, the narrow road, the gates flying open of their own accord, everywhere the tree of life, and the resurrection of the flesh from off the tree—I suppose because their master was crucified, and was himself a worker in wood. Had he been thrown from a cliff, or into a pit, or been hanged; had he been a shoemaker, or a mason, or a smith, we should have had the rock of life, the gulf of resurrection, the rope of immortality, or the holy leather, or the blessed stone, or the steel of charity. What nurse would not be ashamed to tell such fables to a child?

---

[1] The celestial mother of the Valentinians.

Then there are those who practise incantation and exorcism with diagrams and mystic numbers. I have seen books with the names of spirits and formulas for spells in the hands of some of their priests. An Egyptian once told me that magic had power on fools and sensualists, but could touch no one who was sound in mind and body. The Christians dream of some antagonist to God—a devil, whom they call Satanas, who thwarted God when He wished to benefit mankind. The Son of God suffered death from Satanas, but they tell us that we are to defy him, and to bear the worst that he can do: Satanas will come again and work miracles, and pretend to be God, but we are not to believe him. The Greeks tell of a war among the gods; army against army, one led by Saturn and one by Ophiucus; of challenges and battles; the vanquished falling into the ocean, the victors reigning in heaven. In the Mysteries we have the rebellion of the Titans, and the fables of Typhon, and Horus, and Osiris. The story of the devil plotting against man is stranger than either of these. The Son of God is injured by the devil, and charges us when we are afflicted to bear it patiently. Why not punish the devil, instead of threatening poor wretches whom he deceives?

Christ must needs suffer, you say, because it was so foretold. The oracles under whose guidance so many colonies have been founded were nothing, but every word spoken or not spoken in Judæa must be infallible. Prophets and diviners are to be found at the present day scattered everywhere. They are to be met with in temples, and camps, and cities, with crowds gathered about them. 'I am God,' they say, 'or the son of God, or the Holy Spirit, and I have come because the world is to perish, and you, oh men, are like to perish, too, in your iniquities; but I will save you; hereafter you will see me coming in the power of heaven; blessed are those who believe in me now; the rest I will burn with everlasting fire; repentance will then be in vain; only those who now listen shall escape.' Then they utter some unintelligible nonsense from which any rogue or blockhead can extract whatever meaning pleases him. I have myself spoken with some of these persons, who, when cross-questioned, have confessed that they were impostors. If prophets like these were to foretell that God was to fall sick and die, must God fall sick and die because they say so? What is incredible and unworthy may not be believed, though all mankind go mad and prophesy it. The Jewish prophets, inspired by God, you say, foretold that Christ would come to do this and that, and the prophets could not err. God through Moses promised the Israelites temporal prosperity and earthly dominion; He bade them destroy their enemies, sparing neither old nor young, and threatened them with destruction themselves unless they obeyed Him. The Son of God condemned riches, condemned ambition; men were to care no more for food or raiment than the ravens or the lilies; they were to offer the cheek to be smitten. It seems that either Moses was wrong or Christ was wrong; or are we to suppose that God changed his own mind?

You dream, perhaps, of another and better world, another existence, as in some Elysian fields, where all riddles will be solved and all evil be put away. You say unless God can be seen in the form of a man, how are we to know Him? How can anything be known, except by the senses? You might see Him, if that was all, in the Greek temples. But your words are the words of flesh, not of reasonable men. Then only can you see God when you close the eyes of the body and open the eyes of the intellect, and if you need a guide upon the road, avoid the quacks and conjurers who promise to show you ghosts. Put away your vain illusions, your marvellous formulas, your lion and your Amphibius, your God-Ass and your celestial door-keepers,[1] in whose names, poor wretches, you allow yourselves to be persecuted and impaled. Plato says that the Architect and Father of the Universe is not easily found, and when found cannot be made known to common minds. Go learn of Plato how truth is sought for by those who are inspired indeed. Hard and narrow is the way that leads to light, and few can find it; but through the efforts of the wise we are not left wholly without some glimpse, without some conception, of that awful and eternal being. Lost in the flesh as you are, and without pure vision, I know not if you can follow me. That which is intelligible is perceived by the mind. That which is visible is perceived by the eye. The spirit apprehends the things of the spirit, the eye apprehends the things of the eye; and as the sun in this visible universe is not the eye and is not sight, but is the power which enables the eye to see and enables all sensible things which are the object of vision to be seen, so God is not intellect, and is not spirit, and is not knowledge, but through Him the spirit perceives, the intellect knows; in Him all truth and all objects of knowledge have their being; and He Himself, by some ineffable agency, is seen above them all. I speak as to men of understanding. It will be well if you can follow me. The spirit you speak of which you pretend has come down to you from God to teach his mysteries, is the same spirit which has made these truths known to us. If you cannot comprehend, I bid you be silent. Cover up your ignorance. Call not those blind whose eyes are open, nor those lame who run; and live as you will in your body, which is the dead part of you. If you must needs have some new doctrine, adopt some illustrious name, better suited to the dignity of a divine nature. If Hercules and Esculapius do not please you, there was Orpheus. He too died by violence. If Orpheus has been taken by others, there was Anaxarchus, who was beaten to death and mocked at his executioners. 'Pound on,' he said, 'you can pound the sheath of Anaxarchus, himself you cannot pound.' The men of science, you may tell me, have appropriated Anaxarchus. Well, then, take Epictetus, who, when his master was wrenching his leg upon the rack, smiled, and said he would break it, and, when he did break it, said, 'I told you so.' Even the Sibyl, whose poems you interpolate with your own fables, you might have called a daughter of God with a sort of reason. Your own legendary heroes would have been more presentable than the one whom you have chosen: your Jonah who was in the whale's belly, or your Daniel in the lions' den.

---

[1] An allusion to some of the Gnostic heresies.

his Sa

You boast that you have no temples, no altars, no images. The absence of such things is not peculiar to you. The nomad Scythians and the Africans have none. The Persians have none. The Persians say the gods are not like men, and they will not represent them as men. Heraclitus says that prayer to an image is like prayer to a house wall. But you, in condemning images, are inconsistent with yourselves, for you say that man was made in the image of God. The images in the temples you pretend are images of genii. If this be so, and if there be genii, why should not they be adored? Is not everything directed by God? Is not God's providence over all? Angels, genii, heroes, have they not each their own law prescribed by God? are they not ministering spirits set over their several provinces according to their degree? and why, if we adore God, should we not adore those who bear rule under Him?

No man, you say, can serve many masters. This is the language of sedition—of men who would divide themselves from the society of their fellows, and would carry God along with them. A slave cannot serve a second master without wronging the first to whom he belongs. But God can suffer no wrong. God can lose nothing. The inferior spirits are not his rivals, that He can resent the respect which we pay to them. In them we worship only some attribute of Him from whom they hold authority, and in saying that one only is Lord you disobey and rebel against Him. Nor do you practise your own profession. You have a second Lord yourselves, a man who lived and died a few years ago; you pretend still that in God's Son you still worship but one God; but this is a subtle contrivance that you may give the greater glory to this Son. You say that in your 'Dialogus Cœlestis,' 'If the Son of Man is stronger than God and Lord of God, who else can be Lord of Him who is above God?'[1] You have a God above the heavens—Father of the son of man, whom you have chosen to worship; and to this son of man you give the glory of God by pretending that he is stronger than God. You have no outward services, because you prefer to be connected by a secret bond among yourselves. The true God is the common Father of us all. From us He needs nothing. He is good, and in Him is no jealousy or malice. What hurt can His most devoted servants fear from taking part in the public festivals? If the images presented there be idols, they are without power to injure. If they are spirits, they are spirits sent from God, and deserve the honour and service assigned to them by the laws. Your customs require you to abstain from the flesh of some of the animals which are offered in sacrifice. Be it so. Abstain if you will from the flesh of all animals. Pythagoras did the same. But if, as you pretend, you will not be partakers with genii, are the genii only present when the victims are slain? The corn and herbs which you eat, the wine you drink, the water and the very air you breathe, are they not all created by the spirits that are set over them? Either you must not live in this world at all, or you must offer your thanksgivings and prayers to the beings from whom you receive all that you have. These supermundane and ethereal officials may be dangerous if they are neglected or insulted. You are only in danger from them, you say, if you call them by their barbarous names. You are safe if you keep to Latin and Greek equivalents. You may curse a Zeus or Apollo and strike him in the face, and he takes no notice. Alas, my good people, we, too, can outlaw your spirit by sea and land; we can take you who are his images and chain you and kill you. And your Son of God, or whatever you please to call him, is no less indifferent. We do not learn that those who put him to death suffered anything extraordinary. What has befallen since his end to persuade us that your son of man was Son of God? He was sent into the world as God's ambassador. He was killed, his message perished with him; and, after all these generations, he still sleeps. He suffered, you say, with his own consent. May not those whom you revile suffer also with their consent? It is well to compare like with like. Is there no evidence for the presence of God's Spirit in the established religion? Need I speak of the oracles? the prophecies announced from the shrines?

---

[1] The 'Dialogus Cœlestis' was perhaps a Marcionite book. Origen knew nothing of it, and declined to be responsible for it.

the revelations in the auguries? the visions of divine beings actually seen? All the world is full of these things. How many cities have been founded at the bidding of an oracle? How many rescued from plague and famine? How many have perished miserably when the oracle's commands were neglected? Princes have flourished or fallen. Childless parents have obtained their wishes. The sick and maimed have recovered health and strength. Blasphemers have gone mad confessing their crimes. Others have killed themselves, or fallen into mortal illness; some have been slain on the spot by an awful sentence out of the shrine.

You tell of the eternal torments which await the wicked. You say no more than the interpreters of the Mysteries. But the penalties which you pronounce against them, the chiefs of the Mysteries pronounce against you. Why should you be more right than they? They and you are equally confident in your message; and they as well as you have their miracles and prophecies. For your message in itself (I do not speak to such of you as are troubled about a bodily resurrection; with them it is vain to reason), to those among you who believe that the soul or intellect is immortal (intellectual spirit, holy or blessed spirit, living spirit, effluence from incorporeal nature celestial and imperishable, name it as you please), to those who believe that the wicked will suffer everlastingly, and that the righteous will enjoy eternal happiness in the presence of God, I say that they believe truly and well. Let them hold to this doctrine. May it never be abandoned either by them or any man! Perhaps for all human beings some penal purgatory is necessary to purify the soul from the passions and pollutions by which it has been stained in its connection with the body. Mortals, Empedocles tells us, must wander apart from bliss in countless forms for 30,000 years, and are committed to the keepers of the prison-house. One, however, of two things: either you must recognize the usages of the commonwealth and respect its ministers, or the commonwealth cannot bear your presence. You must go from us and leave no seed behind you, that the trace of you may be blotted off the earth. If you choose to marry and rear children, and eat the fruit of the ground and share in the common interests of life, you must submit to the conditions, although they may not be wholly to your taste. All of us have to bear with things which we could wish otherwise. It is a law of nature, and there is no remedy. You must pay honour to those who are set over you. You must discharge the duties of this life until you are released from the bonds of it. You cannot have the benefits of society and refuse to share its obligations. In some places the religious customs may be extravagant and superstitious, and wise men use their judgment as to the credit which they attach to them. But if the Romans were to listen to you, to abolish all their laws and customs, and to worship only your Most High, or what you please to call Him, you will not pretend that He will come and fight for them and defend them from their enemies. According to you, He promised the Jews more than this, yet He has done little either for them or for yourselves. The Jews were to have ruled the world, and they have not a yard of ground to call their own. You are only safe when you keep concealed. If you are found you are executed. God must never be forgotten either by day or night, either in public or private, either in speech or action. Whatever we do or leave undone, we should have God ever before our minds, but we must obey also the princes and rulers of this world, the powers, whatever they be, which have authority here. I do not say that obedience is without limit. If a servant of God be commanded to do some wrong act or speak an irreverent word, he is bound to disobey. He must bear all torture and all death sooner than say or do what God forbids: but if the order be to salute the Sun or sing a hymn to Athene, he does but glorify God the more when he praises God's ministers; nor is it unlawful to swear by the emperor, for to the emperor the world is given in charge, and under him you hold all that you have.

A monarch is enthroned upon earth to whom God has committed the sceptre. Refuse to acknowledge him, refuse to serve under him in the state or the army, and he has no choice but to punish you, because if all were to act as you do he would be left alone and unsupported; the empire would be overrun by the barbarians, and all sound knowledge would be destroyed, your own superstition along with it. You have no fear, you say; you can face the prospect; you are content to see ruler after ruler perish if only he will listen to you. If the rulers have any prudence they will first make an end with you. Your notion that all the world can be brought to one mind in religion, Asiatic, European, African, Greek, and Barbarian, is the wildest of dreams. It cannot be. The very thought reveals your ignorance. Your duty is to stand by your sovereign, in the field, in the council-chamber, wherever he requires your service. Do justly in your place as citizens, and make yourselves worthy members of the commonwealth.[1]

Such is the general bearing of this memorable treatise. There must be large gaps in many parts where the connection is broken. The conclusion is abrupt. It was, perhaps, a further development of the political aspect of the question, which Origen thought it unnecessary to quote. In places he seems to have misunderstood Celsus, in places to have unconsciously done him injustice. Throughout we do not know where we have the words of Celsus himself, and where a paraphrase of what Origen thought him to mean. Occasionally where a paragraph appears to be quoted verbally, it is unintelligible from want of context, and we are driven to Origen's rejoinders to discover what Celsus is talking about. On the whole, however, the sketch which I have given does, I believe, represent faithfully in a generalized form the argument which obstructed for a century the progress of Christianity The reply, which was long an arsenal for Christian advocates, is as beautiful as it is voluminous. It is the unfolding of the position of the Christian Church towards the surrounding world in all its simplicity, its innocence, and spiritual purity. Good men are not protected from intellectual errors. Their thoughts are occupied with higher subjects, and they attend, perhaps, less than others to merely secular learning. When he is off his own ground and attempts to answer Celsus on questions of fact, on science, on history, on statesmanship, Origen is a child contending with a giant. In the 'True Account' we find the tone and almost the language of the calm, impartial, thoughtful modern European. We find the precise attitude in which a sensible man in our own time would place himself towards any new revelation which might present itself now, pretending to be supported by miracles and interfering with political obligations. Celsus was in advance of his age. He was on an elevation from which he could survey the past and current superstitions, and detect the origin of most of them in ignorance or credulity. Origen replies to him from the level of contemporary illusions, from which he was as little free as the least instructed of his catechumens. Celsus tells him that 'names' are not things, that names are but signs, and that different words in different languages mean the same object: that when religious Greeks speak of Zeus, and Latins of Jupiter, and Persians of Dis, and Jews of Jehovah, they all mean the common Father of mankind. Origen answers that this cannot be, because if the formula of the God of Abraham, the God of Isaac, and the God of Jacob, was properly pronounced, miracles were every day notoriously worked by it, while the names of the other gods had no power at all. So throughout his whole argument he assumed that the earth was full of demons; that the heathen gods were demons; that the oracles were inspired by demons; that madness and disease were possession by demons. The conjurers, whom Celsus and Lucian knew to be charlatans and impostors, were to Origen enchanters who had made a compact with Satan or had gained a power over him by magical arts. Christianity was encountering the mystery of evil on its own supernatural platform, and putting to flight with supernatural weapons the legions of hell. Celsus had studied natural history accurately and intelligently. Origen was on the same ground as his contemporaries, and availed himself of popular errors to gain credibility for the Christian miracles. Thus he meets the objection to the virgin birth of Christ by alluding to parthenogenesis among animals, and by asserting that the vultures were an acknowledged instance of it. Celsus understood the generation of human legends, and knew their worth or worthlessness. Origen took what he found. He parallels the angel's visit to Joseph with the vision which forbade Ariston, Plato's father, to approach his wife till the first child was born. He thought the story worth producing, though he did not pledge himself to a belief that it was true. He did not see that the readiness of mankind to invent and receive such stories tended rather to suggest in all instances an analogous origin for them in human enthusiasm. To Origen the resurrection was not unexampled, because Plato says that 'Heras, the son of Arminius, had returned to life after being twelve days dead,' and 'many others were known to have risen out of their graves after they had been buried.' And when Celsus asks why Christ was seen only by his disciples after his resurrection, Origen answers that after He had spoiled principalities and powers, his body had peculiar properties and was only visible to those who were in a proper spiritual condition.

---

[1] Origen says on this very important point that Christians will only assist the Emperor with their own weapons. They will put on the armour of God. They will pray for the success of the Imperial armies when the cause is a just one. The priests of the temples were excused from shedding blood, and confined themselves to intercession. Christians abstained on the same ground to keep their hands pure. They were willing to pray for the confusion of the enemies of justice, and by defeating the evil spirits who had caused a war they would benefit the Emperor more than they could do by fighting with their hands. Serve under him as legionaries they would not, however he might try to force them.

The Fathers were divided on the matter. Tertullian wavers, but inclines to agree with Origen. Many Christians did as a fact serve in the Imperial army. The complaint of Celsus, and Origen's defiant language eighty years after, show, however, that their rule was to abstain; and we need no further explanation of the 'persecutions.' Liability to military service is a universal condition of citizenship, and no nation modern or ancient would tolerate a refusal on the plea of conscience. x

x See Tolstoi's "Kingdom of God"

Most persons would now admit that Celsus spoke with wise diffidence when he hesitated at the assumption that the universe and all that it contained was created solely for the sake of man. Origen is perfectly certain that God had no other object. Sun, moon, and stars, and earth and everything living upon it, were subordinated to man. In man alone, or in reference to man, the creation had its purpose and meaning. As to Adam, and the story of Paradise, it was an allegory. Adam was Adam, and he was also human nature. Allegory was always a resource when other arguments were wanting. The wholesale slaughter of the people of Canaan enjoined upon the Israelites seemed to Celsus inconsistent with the injunction to turn the cheek to the smiter. Origen boldly answers that by the Canaanites were meant the Israelites' own evil dispositions; the children of Babylon who were to be dashed against the stones, were their own wicked thoughts and inclinations, which they were ordered to tear out and fling from them. A yet bolder flight of his imagination was his escape from difficulties with the Ark. The dimensions, he said, were wrongly given. The Ark, which was a hundred years in building, was as large as an enormous city.

But these illustrations give no true conception of Origen's argument, and on the moral and spiritua side Origen was as completely victorious as Celsus was irresistible on the intellectual. Celsus insisted that Christianity was identical in character with a thousand other superstitions. Origen was able to insist on the extraordinary difference, that neither the philosophy of the schools, nor the mysteries, the festivals, the rituals of the heathen gods availed to check the impurity of society, or to alleviate the miseries of mankind, and that vice and wretchedness disappeared in every house into which the Gospel found an entrance. This was true; and it was a truth which outweighed a million-fold the skilfullest cavils of the intellect. A new life had come into the world; it was growing like the grain of mustard-seed by its own vital force, and the earth was growing green under its shadow. Such an argument was unanswerable. No other creed could be pointed to from which any stream was flowing of moral regeneration. Celsus taunted the Christians with addressing their message to the ignorant and the miserable. 'You cannot change the nature of fallen men,' he said. Help those who are helping themselves, and leave fools and sinners to gather as they sow.' Nature, it is true, is inexorable. Nature never pardons, and punishes mistake as harshly as she punishes crime. The law of nature is 'woe to the weak,' and human society follows nature's footsteps. Governed by a stern but wholesome instinct, society insists that each individual shall learn his duty for himself, and shall be made to feel by sharp penalties the consequences of his own transgressions. It is so, and it will be so. There is no danger that the world will ever become too merciful. But against this hard enactment there pleads in mitigation the still soft voice of humanity, which in Christianity for the first time became an effective power. The strong and successful are not always the good; the miserable are not always the wicked; and even for the wicked, pity claims to be heard in mitigation of punishment. They did not make the dispositions which they brought with them when they were born, they did not wholly make the circumstances in which those dispositions were fostered into habits. Compassion for the weak, the divinest attribute of God, now at length began to control and limit the cruelty of nature; conscience, accepting another law for itself, has been compelled by Christianity to submit to a higher rule of obligation.

Christianity abolished the gladiator shows and the fights of men with wild beasts, which turned the spectators into savage beasts themselves. More slowly, but yet surely, Christianity has forbidden the strong to seize the helpless and make them slaves, or to expose children to die lest population should become redundant. The genius of Christianity has covered Europe with hospitals for the sick; has imposed on nations the duty of contending at their own cost against plagues and famine; has created a new virtue in 'charity' which was unknown to Aristotle; and has assigned the highest place to it among human excellences. Even to the poor sinner, the abandoned profligate, given over as irredeemable by the man of the world, and left to perish, Christianity opened a window of hope; for the lost sinner there was the possibility of return; peace, happiness, redemption, recovered purity, were within his reach; the tyranny of evil might still be broken if he himself would turn from it; while the virtuous man, the man who with real success was endeavouring to live well, was not left without a message, as Celsus supposed. He was told to look into his own painted sepulchre of a heart, to compare himself at his best with what he knew that he ought to be, and to say, if he dared, that he, too, had no need of a merciful judgment. The address of the 'Evangel,' the 'good news' to the publican and sinner, which called out the scorn of the cultivated Roman, has introduced a principle into human life which has revolutionized it from base to summit.

As it was with humanity, so it was with licentiousness. The 'resurrection of Christ' was a formula more powerful than the spell of an enchanter to cast out the devils of gluttony and bestiality. It was the eternal symbol of the death to sin and the living to righteousness. 'As Christ died in the body and rose again,' so Christians were bidden to put to death the lusts that were in their flesh, and rise again to purity. Philosophers might lecture in the schools in praise of temperance. Philosophy had become an intellectual plaything; it could not so much as expel the devil out of the philosophers themselves, who, if we can believe Lucian, were the most contemptible beings within the circuit of the Empire. Nor had Lucian himself any power of exorcism, or Celsus, or Marcus Aurelius: they had knowledge and integrity; they had large-minded statesmanship; they might lead pure lives themselves; and they had a healthy scorn for the degradation of most of their contemporaries. But they possessed no spell to cast out the vicious self-indulgence of their age. They could suggest no certain fears or hopes as a motive for a better life. They could not reach the enthusiasm of emotion, which would choose a better life for its own sake, independent of motive. The conscience of the ignorant masses in the Empire was rising in indignation against the depravity of the educated; and neither able nor much caring to examine the historical details of their belief, the disciples of Christianity accepted it in its spiritual completeness, and flung themselves with all their souls into the war with evil.

Their teachers were, like themselves, animated by the same emotions, and reasoned from the same principles. They did not parade the critical proofs of this or that fact mentioned in Scripture. They took the facts as they found them, and turned them to a spiritual purpose. The early Fathers were men often of the highest intellect; but intellect takes various forms; they had not studied either human history, or the world outside them, with the eyes of critics; intellect with them had been poured into the imagination; they saw, as poets see, the spiritual truth underlying the actual, of which the actual is no more than a shell. It was not for them to oppress their hearers with laboured volumes of evidence. 'Believe,' they said; 'faith alone will save you;' and Origen justly defended the bold position. Antecedent belief is the only basis possible for action of any kind. If we wait till we have considered all possibilities, before and behind, till we have reflected on the fallibility of our faculties, and allowed for the effect of emotion or enthusiasm in biassing our judgment, life will be gone before we have begun to live. 'Believe,' in substance said Origen himself, 'that sin is death, that to forsake sin is the resurrection to life. For the rest, the world is full of evil spirits, trying everywhere to mislead or injure you; but if there are devils there are angels; if there are enchanters there are Christ and the saints.' Christianity took up freely into itself the popular theories, the popular modes of thought, and assimilated them to its own likeness, as the growing oak takes in carbon through its leaves and converts it into fibre. It was not a new knowledge imparted authoritatively by men of science. It was the organic development of a new conviction which was taking hold of the hearts of mankind.

Have we, then, no security that the facts of Scripture history are literally and precisely true? The question is less important than it seems. The story of Newton and the apple may be a legend. Yet none the less Newton discovered and revealed the true law of gravitation. A true religion, it cannot be too often repeated, is not a history, but a declaration of the present relation which exists at all times between God and man. So certainly the Fathers of the Church felt, or they would not have treated Scripture facts with the freedom of allegoric interpretation which we uniformly find in them. The 'Iliad' is in form a history, the play of 'Hamlet' is in form a history, and doubtless some historical facts lay at the basis of both one and the other. But the exact incidents which happened in the Troad or at Elsinore are irrelevant to the truth of the 'Iliad' or the truth of 'Hamlet.' History is true or false, as it corresponds, or does not correspond, to facts which occurred once, and never literally repeat themselves. A play or a poem is true if it contains a true picture of human nature; and it embodies not a single order of facts, or the inferences from a single order of facts, but the faithful observation of all human phenomena. Truth is thus of more kinds than one; and the truth which is of most importance to mankind is not the truth of a particular fact which occurred once in time, but the truth of the eternal facts of the constitution of the universe the same yesterday, to-day, and for ever.

27 [illegible]

A CAGLIOSTRO OF THE SECOND CENTURY.

IN the Acts of the Apostles we meet with a class of persons whose features have in our own times become again familiar to us—quacks and conjurers professing to be in communication with the spiritual world, and regarded with curiosity and interest by serious men high in rank and authority. Sergius Paulus was craving for any light which could be given to him, and in default of better teaching had listened to Elymas the Sorcerer. Simon Magus, if we may credit Catholic tradition, was in favour at the Imperial Court of Rome, where he matched his power against St. Peter's, and was defeated only because God was stronger than the devil. The 'curious arts' of these people were regarded both by Christian and heathen as a real mastery of a supernatural secret; and in the hunger for information about the great mystery with which the whole society was possessed, they rose, many of them, into positions of extraordinary influence and consequence. Asia Minor seems to have been their chief breeding ground, where Eastern magic came in contact with Greek civilization, and imposture was able to disguise itself in the phrases of philosophy.

Apollonius of Tyana was the most remarkable of these adventurers. His life, unfortunately, had been written by believers in his pretensions; and we have no knowledge of what he looked like to cool observers. The Apollonius of Philostratus is a heathen saviour, who claimed a commission from heaven to teach a pure and reformed religion, and in attestation of his authority went about healing the sick, raising dead men to life, casting out devils, and prophesying future events which came afterwards to pass. The interesting fact about Apollonius is the extensive recognition which he obtained, and the ease with which his pretensions found acceptance in the existing condition of the popular mind. Out of the legends of him little can be gathered, save the barest outline of his history. He was born four years before the Christian era in Tyana, a city of Cappadocia. His parents sent him to be educated at Tarsus in Cilicia, a place of considerable wealth and repute, and he must have been about beginning his studies there when St. Paul as a little boy was first running about the streets. The life in Tarsus being too luxurious for Apollonius's aspirations, he became a water-drinker and a vegetarian, and betook himself as a recluse to the temple of Æsculapius at Ægæ. Æsculapius, as the god of healing, and therefore the most practically useful, had become the most popular of the heathen divinities. He alone of them was supposed to remain beneficently active, and even to appear at times in visible form in sick-rooms and by sick-beds. Apollonius's devotion to Æsculapius means that he studied medicine. On the death of his father he divided his property among the poor, and after five years of retirement he travelled as far as India in search of knowledge. He discoursed with learned Brahmins there, and came home with enlightened ideas, and with some skill in the arts of the Indian jugglers. With these two possessions he began his career as a teacher in the Roman Empire. He preached his new religion, and he worked miracles to induce people to believe in him. He was at Rome in Nero's time, when Simon Magus and St. Peter are said to have been there. Perhaps tradition has confused Apollonius with Simon Magus or Simon Magus with Apollonius. In the convulsions which followed Nero's murder,

धन्वंतरी

being then an old man, he attached himself to Vespasian in Egypt. Vespasian, who was not without his superstitions, and himself had been once persuaded to work a miracle, is said to have looked kindly on him and patronized him, and Apollonius blossomed out into glory as the spiritual adviser of the Vespasian dynasty. The cruelties of Domitian estranged him. He was accused of conspiring with Nerva, and of having sacrificed a child to bribe the gods in Nerva's interest. He was even charged with having pretended to be a god himself. He was arraigned, convicted, and was about to suffer, when he vanished out of the hands of the Roman police, to reappear at Ephesus, where he soon after died.

Clearly enough, we are off the ground of history in much of this. If Apollonius died at Ephesus in Nerva's time, he was a hundred years old at least, and must have been a contemporary and neighbour of St. John, who is supposed to have been writing his Gospel in the same city about that very time.

However that may be, it is certain that after his death a temple was raised to Apollonius at the place of his birth, and Tyana became a privileged city. Similar honours were assigned elsewhere to him as an evidence of the facility and completeness with which he had gained credit for his pretended divine commission. The truth about him is probably that he was a physician, and had obtained some real knowledge of the methods of curing diseases. In India, besides philosophy and juggling, he may have learnt to practise what is now called animal magnetism; and finding that he had a real power on the nervous system of hysterical patients, the nature of which he did not understand, he may have himself believed it to be supernatural. With these arts he succeeded in persuading his countrymen that he was 'some great one,' 'a great power of God;' and both in life and death, in an age when the traditionary religion was grown incredible, and the human race was craving for a new revelation, Apollonius of Tyana, among many others, was looked upon through a large part of the Roman Empire as an emanation of the Divine nature. Such periods are the opportunities of false prophets. Mankind when they grow enthusiastic mistake their hopes and imaginations for evidence of truth, and run like sheep after every new pretender who professes to hold the key of the mystery which they are so passionately anxious to penetrate.

Our present business, however, is not with the prophet of Tyana. Apollonius left a school of esoteric disciples behind him, with one of whom we are fortunately able to form a closer acquaintance. Apollonius we see through a mist of illusion. Alexander of Abonotichus we are able to look at with the eyes of the cleverest man who was alive on this planet in the second century. With the help of Lucian's portrait of Alexander we can discern, perhaps, the lineaments of Apollonius himself. We can see, at any rate, what these workers of miracles really were, as well as the nature of the element in which they made their conquests, at the side of and in open rivalry with, the teachers of Christianity.

A word first about Lucian himself. At the Christian era, and immediately after it, the Asiatic provinces of the Empire were singularly productive of eminent men. The same intercourse of Eastern and Western civilization which produced the magicians were generating in all directions an active intellectual fermentation. The 'disciples' were 'called Christians first at Antioch.' It was in Asia Minor that St. Paul first established a Gentile Church. There sprang up the multitude of heresies out of conflict with which the Christian creeds shaped themselves. And by the side of those who were constructing a positive faith, were found others who were watching the phenomena round them with an anxious but severe scepticism, unable themselves to find truth in the agitating speculations which were distracting everybody that came near them, but with a clear eye to distinguish knaves and impostors, and a resolution as honourable as St. Paul's to fight with and expose falsehood wherever they encountered it. Among these the most admirable was the satirist, artist, man of letters, the much-spoken-of and little studied Lucian, the most gifted and perhaps the purest-hearted thinker outside the Church who was produced under the Roman Empire. He was born at Samosata on the Euphrates about the year 120. He was intended for a sculptor, but his quick discursive intellect led him into a wider field, and he spent his life as a critic of the spiritual phenomena of his age. To Christianity he paid little attention. To him it appeared but as one of the many phases of belief which were showing themselves among the ignorant and uneducated. But it was harmless, and he did not quarrel with it. He belonged to the small circle of observers who looked on such things with the eyes of men of science. Cool-headed, and with an honest hatred of lies, he ridiculed the impious theology of the established pagan religion; with the same instinct he attacked the charlatans who came, like Apollonius, pretending to a Divine commission. He was doing the Church's work when he seemed most distant from it, and was struggling against illusions peculiarly seductive to the class of minds to whom the Church particularly addressed itself. Thus to Lucian we are indebted for cross lights upon the history of times which show us how and why at that particular period Christianity was able to establish itself. His scientific contemporaries were more antagonistic to it than himself. The Celsus against whom Origen wrote his great defence was probably Lucian's intimate friend. But if Christianity was incredible and offensive to them, men like Apollonius of Tyana were infinitely more offensive. Christianity was at most a delusion. Apollonius of Tyana they hated as a quack and a scoundrel. Besides the treatise which Origen answered, Celsus wrote a book against the magicians. Lucian speaks of Apollonius in a letter to Celsus as if they were both agreed about the character of the prophet of Tyana, and had this book survived we should have perhaps found a second picture there of Apollonius, which would have made impossible the rash parallels which have been attempted in modern times. The companion picture of Alexander of Abonotichus, by Lucian himself, happily remains. When the world was bowing down before this extraordinary rascal, Lucian traced out his history, and risked his own life in trying to explode the imposture. Though human folly proved too strong, and Alexander died, like Apollonius, with the supernatural aureole about him, Lucian, at the express desire of Celsus, placed on record a minute account of the man, lucid to the smallest detail. He describes him as a servant of the devil, in the most modern sense of the word—not of the prince of the power of the air, as a Christian Father would have described him, with evil genii at his bidding, but of the devil of lying and imposture with whom now-a-days we are so sadly familiar. He commences with an apology for touching so base a subject; he undertakes it only at his friend's request. Nor can he tell the entire story. Alexander of Abonotichus was as great in rascaldom as Alexander of Macedon in war and politics. His exploits would fill large volumes, and the most which Lucian could do was to select a few basketfuls from the dungheap and offer them as specimens. Even thus much he feels a certain shame in attempting. If the wretch had received his true deserts, he would have been torn in pieces by apes and foxes in the arena, and the very name of him would have been blotted out of memory. Biographies, however, had been written, and had given pleasure, of distinguished highwaymen; and an account of a man who had plundered, not a small district, but the whole Roman Empire, might not be without its uses.

With these few words of contemptuous preface Lucian tells his story; and in a form still more abridged we now offer it to our readers.

Abonotichus was a small coast town on the south shore of the Black Sea, a few miles west of Sinope. At this place, at the beginning of the second century, the future prophet was brought into the world. His parents were in a humble rank of life. The boy was of unusual beauty; and having no inclination to work and a very strong inclination for pleasure, he turned his advantages to abominable account. By-and-by he was taken up by a doctor who had been one of Apollonius's disciples. The old villain had learnt his master's arts. He understood medicine, could cure stomach-aches and head-aches, set a limb or assist at a lying-in. But besides his legitimate capabilities, he had set up for a magician. He dealt in spells and love-charms; he could find treasures with a divining rod, discover lost deeds and wills, provide heirs for disputed inheritances, and, when well paid for it, he knew how to mix a poison. In these arts the young Alexander became an apt pupil and was useful as a sort of *famulus*. He learnt Apollonius's traditionary secrets, and at the age of twenty, when his master died, he was in a condition to practise on his own account.

He was now thrown on the world to shift for himself. But his spirits were light, and his confidence in himself was boundless: as long as there were fools with money in their pockets, he could have a well-founded hope of transferring part of it to his own. A provincial town was too small a theatre of operations. He set off for Byzantium, the great mart of ancient commerce, which was thronged with merchants from all parts of the world. Like seeks like. At Byzantium, Alexander made acquaintance with a vagabond named Cocconas, a fellow who gained a living by foretelling the winners at games and races, lounging in the betting rings, and gambling with idle young gentlemen. By this means he found entrance into what was called society. Alexander was more beautiful as a man than as a boy. Cocconas introduced him to a rich Macedonian lady, who was spending the season in the city. The lady fell in love with him, and on her return to her country-seat at Pella, carried Alexander and his friend along with her. This was very well for a time; but the situation, perhaps, had its drawbacks. Aspiring ambition is not easily satisfied; and the young heart began to sigh for a larger sphere.

In the midst of pleasure he had an eye for business. In Macedonia, and especially about Pella, there was at this time a great number of large harmless snakes. They came into the houses, where they were useful in keeping down rats and mice; they let the children play with them; they crept into beds at night, and were never interfered with. From this local peculiarity the story, perhaps, originated of the miraculous birth of Alexander the Great. It occurred to the two adventurers that something might be made of one of these serpents. They bought a very handsome specimen, and soon after they left Pella, taking it with them.

For a while they lounged about together, carrying on Cocconas's old trade, and expanding it into fortune-telling. Fools, they observed, were always craving to know the future, and would listen to any one who pretended to see into it. In this way they made much money, and they found the art so easy that their views went higher. They proposed to set up an oracular shrine of their own, which would take the place of Delphi and Delos. The pythonesses on the old-established tripods were growing silent. Apollo, it seemed, was tired of attending them, and inquirers were often sent away unsatisfied. There was clearly a want in the world, and Alexander and his friend thought they saw their way towards supplying it.

The loss of oracles was not the whole of the misfortune. The world was beginning to feel that it had even lost God. The Greek mythology had grown incredible. The Epicureans were saying that there was no such thing as Providence, and never had been. The majority of people were still of a different opinion; but they were uneasy, and were feeling very generally indeed that if gods there were, they ought to make their existence better known. Here was an opportunity, not only of making a fortune, but of vindicating the great principles of religion and becoming benefactors of humanity.

They decided to try. Sleight of hand and cunning might succeed when philosophy had failed. Was it said there were no gods? They would produce a god, a real visible god, that men could feel and handle, that would itself speak and give out oracles, and so silence for ever the wicked unbelievers. So far they saw their way. The next questicn was, the place where the god was to appear. Cocconas was for Chalcedon, on the Asiatic side of the Bosphorus. It was a busy town, almost as full of merchants as Byzantium, the population all engaged with speculation, and money in any quantity to be made there. This was good as far as it went. But Chalcedon was too much in the light. The pagan gods, as the shrewder Alexander knew, were not fond of commercial cities. Christianity might thrive there; but caves, mountains, and woods, remote islands, retired provincial villages, suited better with Apollo and Æsculapius. Traders' wits were sharpened with business, and they might be unpleasantly curious. The simple inhabitants of the interior, Phrygians and Bithynians, Galatians and Cappadocians, would be an easier prey where a reputation had first to be created—and success depended upon a favourable beginning. At his own Abonotichus, he told Cocconas that a man had only to appear with a fife and drum before him, and clashing a pair of cymbals, and the whole population would be on their knees before him.

The better judgment of Alexander carried the day. Abonotichus itself was decided on as the theatre of operations. Cocconas, however, was allowed to introduce Chalcedon into the first act of the drama. Æsculapius, the best believed in of the surviving divinities, was the god who was to be incarnated. Joe Smith must have read Lucian's story, and have taken a hint from it. In the temple of Apollo at Chalcedon the bold adventurers buried some brass plates, bearing an inscription that Apollo and Æsculapius were about to visit Pontus, and that Æsculapius would appear at Abonotichus in a bodily form. The plates were conveniently discovered, and became the talk of the bazaars. Merchants going and coming spread the story. Asia Minor was excited, as well it might be. At the favoured Abonotichus the delighted people resolved to build a temple to receive the god at his coming and they set to work at once, clearing the ground for the foundations.

The train being thus well laid, Alexander had no further need of a companion. Cocconas was a vulgar type of a rogue, unfit for the decorous hypocrisies which were now to be acted. He was left behind on some pretext at Chalcedon, where he died, it was said, from a snake-bite, and so drops out of sight. The supreme performer returned, with the field to himself, to his native town. Lucian describes him as he then appeared; tall, majestic, extremely handsome, hair long and flowing, complexion fair, a moderate beard, partly his own and partly false, but the imitation excellent, eyes large and lustrous, and a voice sweet and limpid. As to his character, says Lucian, 'God grant that I may never meet with such another. His cunning was wonderful, his dexterity matchless. His eagerness for knowledge, his capacity for learning, and power of memory, were equally extraordinary.'

The simple citizens of Abonotichus, on the watch already for the coming of a god among them, had no chance against so capable a villain. They had not seen him since the wonderful days of his boyhood, when he had been known as the *famulus* of an old wizard. He now presented himself among them, his locks wildly streaming, in a purple tunic with a white cloak thrown over it. In his hand he bore a falchion like that with which Perseus had slain the Gorgon. He chanted a doggrel of Alexandrian metaphysics, with monads and triads, pentads and decads, playing in anagrams upon his own name. He had learnt from an oracle, he said, that Perseus was his mother's ancestor, and that a wonderful destiny had been foretold for him. He rolled his beautiful soft eyes. With the help of soap-wort he foamed at the mouth as if possessed. The poor people had known his mother, and had no conception of her illustrious lineage. But there was no disputing with an oracle. What an oracle said must be true. He was received with an ovation, all the town bowing down before him, and he then prepared for his next step.

The snake throughout the East was the symbol of knowledge and immortality. The serpent with his tail in his mouth represented the circle of eternity. The serpent in annually shedding its skin was supposed to renew its life for ever. A sect even of Gnostic Christians were serpent worshippers From the time of the brazen serpent in the wilderness, it was the special emblem of the art of healing; and if the divine physician ever appeared on earth in visible shape, a snake's was the form which he might be expected to assume.

The snake which had been bought at Pella was now to be applied to its purpose. The monster, for it was of enormous size, had accompanied Alexander through his subsequent adventures. It had become so tame that it would coil about his body, and remain in any position which he desired. He had made a human face out of linen for it, which he had painted with extreme ingenuity. The mouth would open and shut by an arrangement of horsehair. The black forked tongue shot in and out, and the creature had grown accustomed to its mask and wore it without objection.

A full-grown divinity being thus ready at hand, the intending prophet next furnished himself with the egg of a goose, opened it, cleared out the contents, and placed inside a small embryo snake just born. This done, he filled the cracks and smoothed them over with wax and white lead. Æsculapius's temple was meanwhile making progress. The foundations had been dug, and there were pits and holes, which a recent rain had filled with water. In one of these muddy pools Alexander concealed his egg, as he had done the plates at Chalcedon, and the next morning he rushed into the market-place in a state of frenzy, almost naked, a girdle of gold tissue about his waist, hair streaming, eyes flashing, mouth foaming, and the Perseus falchion wheeling about his head. The crowd collected at the sight of him, frantic as himself. He sprang upon some mound or bench. 'Blessed,' he cried, 'be this town of Abonotichus, and blessed be they that dwell in it. This day the prophecy is fulfilled, and God is coming to take his place among us.'

The entire population was out, old and young, men and women, quivering with hope and emotion. Alexander made an oration in an unknown tongue; some said it was Hebrew, some Phœnician, all agreed that it was inspired. The only words articulately heard were the names of Apollo and Æsculapius. When he had done he set up the familiar Psalm of the Sun God, and moved, with the crowd singing in chorus behind him, to the site of the temple. He stepped into the water, offered a prayer to Æsculapius, and then asking for a bowl he scooped his egg out of the mud.

'Æsculapius is here,' he said, holding it for a moment in the hollow of his hand. And then, with every eye fixed on him in the intensity of expectation, he broke it. The tiny creature twisted about his fingers. 'It moves, it moves!' the people cried in ecstasy. Not a question was asked. To doubt would have been impious. They shouted. They blessed the gods. They blessed themselves for the glory which they had witnessed. Health, wealth, all pleasant things which the gods could give, they saw raining on the happy Abonotichus. Alexander swept back to his house bearing the divinity in his bosom, the awe-struck people following. For a few days there was a pause, while the tale of what had happened spread along the shores of the Black Sea. Then on foot, on mules, in carts, in boats, multitudes flocked in from all directions to the birthplace of Æsculapius. The roads were choked with them; the town overflowed with them. 'They had the forms of men,' as Lucian says, 'but they were as sheep in all besides, heads and hearts empty alike.' Alexander was ready for their reception. He had erected a booth or tabernacle with a door at each end and a railed passage leading from one door to the other. Behind the rail on a couch in a subdued light, the prophet sat visible to every one, the snake from Pella wreathed about his neck, the coils glittering amidst the folds of his dress, the tail playing on the ground. The head was concealed; but occasionally the prophet raised his arm, and then appeared the awful face, the mouth moving, the tongue darting in and out. There it was, the veritable traditionary serpent with the human countenance which appears in the mediæval pictures of the Temptation and the Fall.

The prophet told the spectators that into this mysterious being the embryo that was found in the egg had developed in a few days. The place was dark; the crowd which was pressing to be admitted was enormous, The stream of worshippers passed quickly from door to door. They could but look and give place to others. But a single glance was enough for minds disposed to believe. The rapidity of the creature's growth, so far from exciting suspicion, was only a fresh evidence of its miraculous nature. The first exhibition was so successful that others followed. The first visitors had been chiefly the poor; but as the fame of the appearance spread, the higher classes caught the infection. Men of fortune came with rich offerings; and so confident was Alexander in their folly, that those who gave most liberally were allowed to touch the scales and to look steadily at the moving mouth. So well the trick was done that Lucian says, 'Epicurus himself would have been taken in.' 'Nothing could save a man but a mind with the firmness of adamant, and fortified by a scientific conviction that the thing which he supposed himself to see was a physical impossibility.'

The wonder was still imperfect. The divinity was there, but as yet he had not spoken. The excitement, however, grew and spread. All Asia Minor was caught with it. The old stories were true, then. There were gods after all, and the wicked philosophers were wrong. Heavy hearts were lifted up again. From lip to lip the blessed message flew; over Galatia, over Bithynia, away across the Bosphorus, into Thrace and Macedonia. A god, a real one, had been born at Abonotichus, with a serpent's body and the face of a man. Pictures were taken of him. Images were made in brass or silver, and circulated in thousands. At length it was announced that the lips had given an articulate sound.

'I am Glycon, the sweet one,' the creature had said, 'the third in descent from Zeus, and the light of the world.' [illegible]

The temple was now finished. Proper accommodation had been provided for Æsculapius and his prophet priest; and a public announcement was made that the god, for a fit consideration, would answer any questions which might be put to him. There was a doubt at first about the tariff. Amphilochus, who had migrated from Thebes to a shrine in Cilicia, and had been prophesying there for ten centuries, charged two obols, or three pence, for each oracle; but money had fallen in value, and answers directly from a god were in themselves of higher worth. Æsculapius, or Alexander for him, demanded eight obols, or a shilling. Days and hours were fixed when inquirers could be received. They were expected to send in their names beforehand, and to write their questions on a paper or parchment, which they might seal up in any way that they pleased. Alexander received the packets from their hands, and after a day, or sometimes two days, restored them with the answers to the questions attached.

People came, of course, in thousands. The seal being apparently unbroken, the mere fact that an answer was given of some kind predisposed them to be satisfied with it. Either a heated knife-blade had been passed under the wax, or a cast of the impression was taken in collyrium and a new seal was manufactured. The obvious explanation occurred to no one. People in search of the miraculous never like to be disappointed. Either they themselves betray their secrets, or they ask questions so foolish that it cannot be known whether the answer is true or false. Most of the inquirers came to consult Æsculapius about their health, and Alexander knew medicine enough to be able generally to read in their faces what was the matter with them. Thus they were easily satisfied, and went away as convinced as when they arrived. The names being given in beforehand, private information was easily obtained from slaves or companions. Shrewd guesses were miracles, when they were correct, and one success outweighed a hundred failures. In cases of difficulty the oracular method was always in reserve, with the ambiguities of magniloquent nonsense. The real strength of Alexander was in his professional skill, which usually was in itself all-sufficient. He had a special quack remedy of his own, which he prescribed as a panacea, a harmless plaster made out of goat's fat. To aspiring politicians, young lovers, or heirs expectant, he replied that the fates were undecided, and that the event depended on the will of Æsculapius and the intercessions of his prophet.

Never was audacity greater or more splendidly rewarded. The gold ingots sent to Delphi were as nothing compared to the treasures which streamed into Abonotichus. Each question was separately paid for, and ten or fifteen were not enough for the curiosity of single visitors. The work soon outgrew the strength of a single man. The prophet had an army of disciples, who were munificently paid. They were employed, some as servants, some as spies, oracle manufacturers, secretaries, keepers of seals, or interpreters of the various Asiatic dialects. Each applicant received his answer in his own tongue, to his overwhelming admiration. Success brought fresh ambitions with it. Emissaries were dispersed through the Empire spreading the fame of the new prophet; instigating fools to consult the oracle, and letting Alexander know who they were and what they wanted. If a slave had run away, if a will could not be found, if a treasure had been secreted if a robbery was undiscovered, Alexander became the universal resource. The air was full of miracles. The sick were healed. The dead were raised to life, or were reported and were believed to have been raised, which came to the same thing. To believe was a duty, to doubt was a sin. A god had come on earth to save a world which was perishing in scepticism. Simple hearts were bounding with gratitude; and no devotion could be too extreme, and no expression of it in the form of offerings too extravagant. Æsculapius might have built a throne of gold for himself out of the pious contributions of the faithful. Being a god, he was personally disinterested; 'gold and silver,' he said through the oracle, 'were nothing to him; he commanded only that his servant the prophet should receive the honours due to him.'

High favour such as had fallen upon Alexander could not be enjoyed without some drawbacks. The world believed, but an envious minority remained incredulous, and whispered that the prophet was a charlatan. The men of science persisted that miracles were against nature, and that a professing worker of miracles was necessarily a rogue. The Christians, to whom Lucian does full justice in the matter, regarded Alexander as a missionary of the devil, and abhorred both him and his works. Combinations were formed to expose him. Traps were cleverly laid for him, into which all his adroitness could not save him from occasionally falling. But he had contrived to entangle his personal credit in the great spiritual questions which were agitating mankind, and to enlist in his interest the pious side of paganism. The schools of philosophy were divided about him. The respectable sects, Platonists, Stoics, and Pythagoreans, who believed in a spiritual system underlying the sensible, saw in the manifestation at Abonotichus a revelation in harmony with their theories. If they did not wholly believe, they looked at it as a phenomenon useful to an age which was denying the supernatural.

Alexander, quick to catch at the prevailing influences, flattered the philosophers in turn. Pythagoras was made a saint in his calendar. He spoke of Pythagoras as the greatest of the ancient sages. He claimed to represent him; at length he let it be known privately that he was Pythagoras. He gilt his thigh, and the yellow lustre was about to be seen. The wise man of Samos was again present unrecognized, like Apollo among the herdsmen of Admetus.

The philosophers of the second century, if Lucian can be believed, were not a lofty set of beings. They professed sublime doctrines, but the doctrines had little effect on their lives, and the different schools hated one another with genuine sectarian intensity. The Pythagoreans were little better than their rivels, but their teaching was more respectable. They insisted that men had souls as well as bodies. They believed in immortality and future retribution, and they had the sympathies with them of the decent part of society. Alexander's instinct led him to them as the best friends he could have; and they in turn were ready to play into his hands in their own interests. By their mystical theories they were the natural victims of illusion. Opinions adopted out of superstition or emotion cannot be encountered by reason. They are like epidemic diseases which seize and subdue the mental constitution. They yield only when they have spent their force, and are superseded by other beliefs of an analogous kind. The spiritual world is ruled by homœopathy, and one disorder is only cured by a second and a similar one.

Thus supported, therefore, Pythagoras Alexander replied to attempts at exposure by open defiance. Pontus, he said, was full of blaspheming atheists and Christians; Æsculapius was displeased that, after he had condescended to come among his people, such wretches should be any longer tolerated; and he demanded that they should be stoned out of the province. A pious inquirer was set to ask after the soul of Epicurus. Æsculapius answered that Epicurus was in hell, lying in filth, and in chains of lead. The Pythagoreans clapped their hands. Hell, they had always said, was the proper place for him; and in hell he was; the oracle had declared it.

It is very interesting to find two classes of men, generally supposed to be so antagonistic as the men of science and the Christians, standing alone together against the world as the opponents of a lying scoundrel. The explanation of their union was that each of them had hold of a side of real truth, while the respectable world was given over to shadows. The Epicureans understood the laws of nature and the principles of evidence. The Christians had a new ideal of human life and duty in them, which was to regenerate the whole race of mankind. It was thus fit and right that they should work together against a wretch who understood nothing but human folly and the art of playing upon it, and against the gulls and idiots who were ready to swallow any absurdity which surprised or flattered them.

The Epicureans were Alexander's most dangerous enemies; for they had friends in the higher circles of society. Amestris, between Abonotichus and the Bosphorus, was the seat of the provincial administration. Lepidus, the Roman propraetor, was a man of sense and culture. The town took its intellectual tone from him, and was unfavourable to the prophet's pretensions. Ingenious tricks had been played upon him from that quarter, with too much success; and he had been driven to announce that for the future no inquiries sent from Amestris would be entertained. Some mockeries had followed. Alexander could not afford to let the public enthusiasm cool, and mistakes for the future must be avoided. Æsculapius had hitherto communicated with his worshippers in writing. When he uttered sounds, it was in private to the prophet. To silence doubt, the serpent was now to be heard directly speaking. A tube was fitted through which articulate noises could be made to issue from the snake's mouth with the help of a confederate behind the curtain. Select visitors only were admitted to this especially sacred performance, and a high price had to be paid for it. But the experiment was tried with perfect success; and the method was found to have its conveniences. The word-of-mouth oracles were taken down and were given afterwards to the world; but if mistakes had been made, they could be altered before publication. An accident of the kind happened shortly after, which might have been disastrous if the original practice had been followed, but which Alexander was able to turn into a brilliant success.

Severian, a Roman general, had been sent by the emperor Verus to invade Armenia. He called at Abonotichus on his way, to learn if he was likely to succeed, and Æsculapius encouraged him with his own lips in bad Homeric verse. He had told Severian, that he would subdue the Armenians, and return in glory to Rome with the bay wreath on his temples and wearing the golden circlet of Apollo. Severian, whether he believed Æsculapius or not, went his way, lost his army, and was himself killed. The oracle was immediately reversed. The line which appeared in the published record was: 'Go not against the Armenians, where death and disaster await thee.' Thus out of 'the nettle danger' Alexander 'had plucked the flower safety.' The death of Severian was explained by his neglect or defiance of the warning. In another way, too, he showed his prudence. He made friends at the rival shrines. Monopolies, he knew, were odious and dangerous. If Æsculapius spoke through him, Apollo spoke now and then elsewhere. He would sometimes tell a patient that he had no message for him, and that he must go for advice to Claros or to the cave of the Branchidæ.

Thus he continued to baffle his detractors, and to rise from glory to glory. His fame reached the Imperial Court, and to consult Alexander became the fashion in high Roman society. Ladies of rank, men of business, intriguing generals or senators, took into their counsels the prophet of Abonotichus. Some who had perilous political schemes on hand were rash enough to commit their secrets to paper, and to send them, under the protection of their seals, for the opinion of Æsculapius. The prophet, when he discovered matter of this kind, kept the packets by him without returning them. He thus held the writers in his power, and made them feel that their lives were in his hands.

And there were others in high position, men of thought who were waiting for some kind of revelation, that sought him out from purer motives. Rutilian, a senator, in favour with the Emperor, a man of ability, who had passed his life in the public service, and still held an important office, adopted Alexander for his spiritual father. Rutilian was a Pythagorean of most devout temperament, assiduous in prayers to the Invisible Being or Beings of whose existence he was assured. When he heard that Æsculapius had come into the world, he had already a predisposition to believe, and was prevented only by public duties from flying to learn if the news was true. He could not go to Pontus himself, but he sent friends on whom he could rely, and whose temperament resembled his own. The majestic appearance of the prophet, the inspired eyes, the rich sweet voice, awed them into immediate conviction. They were shown wonders; but they had believed before they had seen, and they returned to Rome to exaggerate what they had witnessed. Rutilian, receiving their report into his own eager imagination, brought it out of the crucible again transfigured yet more gloriously. He was a man of known piety and veracity, incapable of conscious falsehood, true and just in all his dealings. Astonished Rome could not yet wholly surrender itself. Officers of the imperial household hastened over to see with their own eyes. It had not occurred to them that they might see things which they could not explain, yet that what they saw might be no more than a trick. Men without scientific training who trust their own judgment in such matters are the natural prey of charlatans. These gentlemen came to Abonotichus. They were received with the highest honours. Alexander displayed his miracles to them, made them handsome presents, and sent them home open-mouthed to glorify Æsculapius and his prophet in the fullest confidence that they were speaking nothing but the truth. Rutilian was triumphant. He was now either relieved from office, or he obtained leave of absence, and at last was able to throw himself in person at the apostle's feet. He was sixty years old at the time when the acquaintance began. His wife was dead, and he had one only son. The first question which he asked Alexander was about his boy's education. Alexander told him that his teachers were to be Pythagoras and Homer. The child died, and went to his tutors in Hades; and the prophet at the first step had given a convincing proof of his inspiration. Lucian, in his contempt of folly, half pardons Alexander when such a man as Rutilian was so eager to be his dupe. The new disciple, being a Pythagorean, believed in pre-existence. He asked through what personalities he had himself passed already. Alexander told him that he had been no less a person than Achilles. After Achilles he had been Menander, and when his present life was over he was to become immortal, and live thenceforward as a sunbeam. Rutilian believed it all. No absurdity was too monstrous for him; while he on his part was infinitely useful to Alexander. Few sceptics were hardy enough thenceforward to question the character of the friend of the Emperor's favourite.

Among his female adorers or connections, of whom Alexander had as many as Brigham Young, there was a girl whom he called his daughter, on the mother's side of exalted parentage. Selene, or the Moon, had seen Alexander sleeping like Endymion, had become enamoured of him, and had descended to his embraces. The young lady he declared to be the offspring of this celestial union. Rutilian being a widower was informed that Selene and Æsculapius had selected him to be her husband. He was delighted. He believed the marriage to be an adoption into heaven. Like Menelaus, he would never die, being the son-in-law of a god, and the nuptials were celebrated with august solemnity.

Abonotichus after this became a holy city, a Mecca, a place of pilgrimage. The prophet was a power in the Empire, and began to surround himself with pomp and display. Among other ceremonies he instituted a public service in the temple in imitation of the mysteries of Eleusis. That he was able to present such scenes with impunity is a most curious illustration of the mental condition of the time.

The service commenced with a procession of acolytes carrying torches, the prophet at their head, like the priests of Ceres, giving notice to the profane to keep aloof, and inviting the believers in Æsculapius to approach and take part in the holy mystery. The profane whom he specially meant were the Christians and the atheists. The prophet spoke; the congregation answered. The prophet said, 'Away with the Christians!' The people replied, 'Away with the atheists!' Those who presented themselves for communion were examined first by Alexander to ascertain their fitness. If found unorthodox, they were excluded from the temple. The ceremonial then commenced. It consisted of a series of tableaux. The first day was given to representations of the lying-in of Latona, the birth of Apollo, the marriage of Apollo and Coronis, with the issue of it in the generation of Æsculapius. On the second day there was the incarnation of 'the sweet one,' with the Chalcedon plates, the goose egg, and the snake. Alexander himself was the hero of the third. A new revelation, it seems, had informed him of the mysterious circumstances attending his own coming into the world. His mother had been visited by Podalirius, Æsculapius's mythical son. The temple was then brilliantly illuminated. The prophet, after some preliminary gesticulations, laid himself down, as Endymion, to sleep upon the couch. Selene, the Moon, personated by the beautiful wife of an officer of the imperial court, who was the prophet's mistress, descended upon him from the roof and covered him with kisses, the husband looking on, delighted with the honour which had fallen upon him. a la Krishna & Gopis.

In the final scene, Alexander reappeared in his priestly dress. A hymn was sung to the snake, the congregation accompanying or responding. The choir then formed into a circle and went through a mystic dance, the prophet standing in the centre.

The miraculous birth of Alexander, after being thus announced, was made into an article of faith which the disciples were bound to receive. A difficulty arose which had not been foreseen. If he was the son of a god, how could he be Pythagoras? and how came he by the golden thigh? He was equal to the occasion; he was not Pythagoras, he said, and yet he was. He had the same soul with Pythagoras; for that soul was the Spirit of God, which waned and was renewed like the moon. The Spirit descended from heaven at special times and on special persons, and again ascended when its purpose was attained. The gold thigh was perhaps explained as its accompanying symbol.

Having indentified himself with the Pythagoreans, he announced with authority the general truth of their doctrines. He insisted on an elevated morality, and directed his disciples to abstain from sensual vices. The rules, however, had no application to himself, and behind the veil he created a Cyprian paradise. His reputation being so well established, the privilege of admission to the temple rites was eagerly sought after.

The oracle, meanwhile, was active as ever, and now and then by its mistakes produced a frightful injustice. A Paphlagonian gentleman had sent his son to be educated at Alexandria. The boy had joined an expedition up the Nile, where he fell in with some merchants on their way to the Red Sea and India. Curiosity led him to accompany them; and his household in the city, who had charge of him, after waiting for a while and finding that he did not come back, concluded that he had been drowned in the river, and returned to Paphlagonia with the news that the boy was dead. The father consulted the seer of Abonotichus. Alexander informed him that his son had been made away with by the servants. The Roman governor was appealed to. The word of Alexander, supported as he was by Rutilian, was conclusive, and the unfortunate wretches were thrown to the wild beasts. Soon after, the boy appeared, none the worse for his journey; and an indignant friend of the family went to Abonotichus to expose the impostor before his worshippers. Unfortunately, a superstition once established is proof against commonplace evidence. Alexander only answered by telling the congregation to stone the blasphemer, who was rescued when nearly dead by the interposition of a casual traveller.

Another adventure into which he fell might have been more dangerous. The war of Marcus Aurelius with the Marcomanni was the occasion of the celebrated story in Christian mythology of the Thundering Legion. It is difficult, and even impossible, to reconcile the account of the war in the Christian legend with Lucian's description of it; but Lucian was alive at the time, and when he says that the Emperor was disastrously defeated, he is unlikely to have been mistaken. Lucian says that Marcus Aurelius, before he began the campaign, applied to Alexander. Alexander told him that if he devoted two lions to the gods and threw them into the Danube, there would be a glorious victory and a happy peace. The lions swam the river, landed on the opposite bank, and were immediately killed. The Emperor lost a battle and many thousand men. Aquileia itself nearly escaped being taken.

This catastrophe tried the faith even of Rutilian. Alexander, however, told him that the gods had foretold a victory, but had not allowed him to know on which side the victory would be. Rutilian resisted temptation and continued to believe.

Affairs, however, had become serious, when such a man was allowed to play with the interests of the Empire. Intelligent Romans went to Abonotichus to make inquiries, and were so troublesome that Æsculapius had to interfere. When a stranger arrived the god decided whether he was to be admitted to reside in the town. A suspicious visitor was ordered to depart under penalties. At last, as a public warning against the dangerous spirit of scepticism, Alexander burnt a copy of the writings of Epicurus in the market square, and threw the ashes into the sea. Lepidus of Amestris, the Roman governor, made another effort. The prophet was on his guard against laymen; but a priest it was thought might be more fortunate. A priest was sent, but unluckily the priest was a fool and gave Alexander a new triumph. He was granted an interview with 'the sweet one,' and conversation followed which Lucian saw hung up in a temple at Tium, written in letters of gold :—

Priest. Tell me, Lord Glycon, who art thou?

Glycon. I am the young Æsculapius, the second and not the first. This is a mystery, which may not be revealed.

Priest. How long wilt thou remain with us?

Glycon. My time is a thousand years and three. Then I go to the East to the barbarians. They also must hear my word.

Priest. What will become of me after this life?

Glycon. First thou wilt be a camel, and then a prop like Alexander.

The dialogue ended with a curse on Lepidus for inquisitiveness and unbelief.

Other means failing, the adventure was next undertaken by Lucian himself. Lucian was a friend of Rutilian. He had many times remonstrated with him. He had endeavoured to prevent his marriage. He had protested against the countenance which Rutilian was lending to a lying rogue. Rutilian pitied Lucian's hardness of heart, and perhaps advised him to go to Abonotichus and examine for himself. Lucian, at any rate, went. Rutilian's friendship secured him respectful treatment. Alexander received him with extreme courtesy, and he admits that the prophet's manners and appearance surprised and struck him. But Lucian was fortified with a conviction that all pretenders to supernatural powers were enthusiasts or impostors, that miracles had never been and could not be. He tried Æsculapius with unusual

Alexander

questions. He asked him first if the prophet wore false hair. He sealed his envelope so skilfully that it could not be opened, and he received an answer in an 'unknown tongue.' He discovered next that the prophet had been sounding his valet as to Lucian's object in coming to him. The valet was faithful, and Lucian bade him tell Alexander that he was suffering from a pain in his side. He then wrote himself, on two slips of paper, 'What was the birthplace of Homer?' enclosed them in two packets, and sealed them as before. The valet informed the prophet that one referred to the pain, and that the other was to ask whether his master should return to Italy by land or sea. The replies were, first, an advice to try Alexander's plaster; secondly, an intimation that the voyage would prove dangerous. These experiments would have been enough for Lucian, but his object was rather to convince his friend than himself, and he tried again.

This time he wrote, 'When will the villanies of Alexander be exposed?' At the back of the envelope he made a note that it contained eight questions, all of which he paid for. The prophet was completely caught; he returned eight answers, the whole of them unintelligible; and with demonstration, as he thought, in his hands, Lucian went to his friend.

He found his labour thrown away. Belief in the marvellous does not rise from evidence and will not yield to it. There is the easy answer, that infidels are answered according to the impiety of their hearts, that the gods will not and perhaps cannot work miracles in the presence of sceptics. Nothing came of the first visit except that Lucian lost the regard of his friend, whom Alexander warned against him. But he had become interested in the matter; he determined to probe the mystery to the bottom. He went to the governor and offered, if he could have security for his life, to furnish him with proofs of the imposition which would justify the interference of the police.

The governor gave him a guard of soldiers, and thus attended he went to Abonotichus a second time. The prophet was holding his levée. Lucian presented himself, neglecting to make an obeisance, to the general scandal. The prophet took no notice, but gave him his hand to kiss, and Lucian bit it to the bone. The believers shrieked and Lucian would have been strangled but for his guard. Alexander, however, to his surprise and real admiration, bore the pain manfully. He told his friends that he and his god had tamed ruder spirits than Lucian's; he bade them all retire, and leave him and his visitor together.

When they were alone, he asked Lucian quietly why a person whose acquaintance he had valued, was determined to be his enemy. Calmness is always agreeable. Lucian never doubted for a moment Alexander's real character, but the prophet interested him in spite of himself. That he might study him at leisure, he accepted his overtures, and even entered into some kind of intimacy with him. He stayed for some days at Abonotichus. The worshippers were astonished to find a blasphemer admitted to confidential intercourse with their chief; and Alexander undoubtedly succeeded, if not in disarming his guest's suspicions, yet in softening the vehemence of his dislike. He was so clever, so well informed, apparently so frank and open, that, as Lucian said, he would have taken in Epicurus himself. The search for evidence against him was dropped, the governor's guard was sent home, and Lucian after a prolonged visit accepted an offer from Alexander to send him by water to the Bosphorus. The prophet placed at his disposition one of his finest vessels, saw him on board, loaded him with presents, and so dismissed him.

Keener-witted man that Lucian was not alive on earth; yet his wit had not saved him from being to some extent deceived, and he had a near escape of paying with his life for his credulity. He had not been long at sea when he observed the pilot and crew consulting together. The crew were insisting upon something to which the pilot would not consent. The pilot at length came to him and said that 'Alexander's orders were that Lucian was to be thrown overboard; he had a wife and children, he had lived respectably for sixty years, and did not wish in his old age to stain his conscience with a murder. He could not go on to the Bosphorus, but he would put his passenger on shore.'

Lucian was landed in Bithynia. He was a person of considerable public influence. He had powerful friends in the province and at Rome. He was looked on favourably by Marcus Aurelius himself. He laid his story before the governor, not Lepidus, but another; and Lucian, if any one, might be assured that what he said would receive attention. But in an era of belief, reason and fact are powerless; the governor told him that if he could convict Alexander on the clearest evidence it would be impossible to punish him. Prophet he was in the opinion of the whole country, and prophet he would remain. Lucian was as little successful as his predecessors, and his interference had gained him nothing except materials for the singular account which he has left behind. Rutilian was abandoned to fate and to the daughter of the Moon, and the glories of the prophet of Abonotichus were established above the reach of calumny. The Emperor bestowed distinctions on him. The name of his town was changed. Coins were struck, and now are extant, with 'the sweet one's' face on one side and Alexander's on the other. He lived to be an old man, and died with his fame undimmed and the belief in him unabated. What became of the snake, history omits to tell.

The superstition did not break in pieces at once. The oracle continued to prophesy after Alexander's death, and there was a competition among the disciples as to which of them was to succeed him. The favourite candidate was an old physician, who, Lucian says, ought not to have been found in such company. The dispute was referred at last to Rutilian, who decided that no successor was needed. Alexander was not dead, but was translated merely into a better world, from which he still watched over his faithful followers.

So ends this singular story, valuable for the light which it throws on a critical epoch in human history, and especially on the disposition of the people among whom Paul and Barnabas were taken for gods, and among whom Paul founded his seven Churches. Christianity exactly met what they were searching for in an ennobling and purifying form, and saved those who accepted it from being the victims of sham prophets like Alexander. To persons so circumstanced, men of intellect like Lucian addressed themselves in vain. The science of Epicurus was merely negative. He might insist that miracles were an illusion, and that the laws of nature were never broken; but to the human heart craving for light from heaven, and refusing to be satisfied without it, Epicurus had not a word to say, not a word of what lay behind the veil, not a word which would serve for guidance in the paths of ordinary duty. Intellect and experience may make it probable to thoughtful persons that morality and happiness go together; but when all is said, clever men are found of a different opinion; and if the human race had waited to recognize the sanctions of moral obligation till science had made out on what they rested to its own satisfaction, the first steps out of barbarism would never have been taken. Knowledge is a plant which grows but slowly. Those who gather knowledge must live before they can learn. How to live therefore, how to distinguish good from evil, press first for an immediate answer. And the answer was given by conscience whole æons before reflecting intellect had constructed its theories of expediency and the greatest happiness of the greatest number.

Out of conscience grows religion; but religion when St. Paul came was dead, and the educated multitudes in the Empire were sitting by the body of it, unable to believe that it was gone, and still passionately hoping that the silent gods would again speak to them out of heaven. So intense was the longing, that reason had abdicated its proper function; any plausible pretender could collect disciples in millions; and to an audience thus prepared to receive it, Christianity was originally offered. Independent of philosophy, the better sort of men hate evil and impurity; their instincts were recognized and justified in the new creed, and they welcomed it as a reviving principle of moral life. It did not save them from illusions which men of science would have escaped. Holiness of life is no protection against freaks of imagination; God is so near to the believer that he sees His action everywhere, and the hagiology of the early Church is as full of legend as the pagan mythology. The apocryphal gospels breathe a spirit to the full as credulous as the story of the incarnation of Glycon at Abonotichus; with this essential and enormous difference, however, that the credulity of the Christians was dominated by conscience, and they detected a polluted impostor with as sure an instinct as the most cultivated Epicurean.

27-7-96

CHENEYS AND THE HOUSE OF RUSSELL.

[*FRASER'S MAGAZINE.* 1879.]

'THE gardener and his wife,' Mr. Tennyson tells us, 'laugh at the claims of long descent.' If it be so, the laugh is natural, for our first parents were 'novi homines,' and could not appreciate what they did not possess. Nevertheless, in all nations which have achieved any kind of eminence, particular families have stood out conspicuously for generation after generation as representatives of political principles, as soldiers or statesmen, as ruling in their immediate neighbourhoods with delegated authority, and receiving homage voluntarily offered. They have furnished the finer tissues in the corporate body of the national life, and have given to society its unity and coherence. In times of war they have fallen freely on the battle-field. In times of discord and civil strife their most illustrious members have been the first to bleed on the scaffold. An English family, it has been said, takes rank according to the number of its members which have been executed. With men, as with animals and plants, peculiar properties are propagated by breeding. Each child who has inherited a noble name feels a special call to do no dishonour to it by unworthy actions. The family falls in pieces when its characteristics disappear. But, be the cause what it may, there is no instance, ancient or modern, of any long-protracted national existence where an order of aristocracy and gentry is not to be found preserving their identity, their influence, and their privileges of birth through century after century. They have no monopoly of genius. A gifted man rises out of the people, receiving his patent of nobility, as Burns said, 'direct from Almighty God.' He makes a name and a position for himself. But when the name is made, he hands it on, with distinction printed upon it, to his children and his children's children. More is expected from the sons of eminent parents than from other men, and if the transmitted quality is genuine more comes out of them. It is not talent. Talent is but partially hereditary, if at all. The virtue that runs in the blood is superiority of courage or character; and courage and character, far more than cleverness, are the conditions indispensable for national leaders. Thus without exception, in all great peoples, hereditary aristocracies have formed themselves, and when aristocracies have decayed or disappeared the state has degenerated along with them. The fall of a nobility may be a cause of degeneracy, or it may only be a symptom; but the phenomenon itself is a plain matter of fact, true hitherto under all forms of political constitution, monarchic, oligarchic, or republican. Republics have held together as long as they have been strung with patrician sinews; when the sinews crack the republic becomes a democracy, and the unity of the commonwealth is shivered into a heap of disconnected atoms, each following its own laws of gravitation towards its imagined interests. Athens and Rome, the Italian Republics, the great kingdoms which rose out of the wreck of the Roman Empire, tell the same story. The modern Spaniard reads the records of the old greatness of his country on the tombs of the Castilian nobles, and in the ruins of their palaces. They and the glory of the Spanish race have departed together. The Alvas and the Olivarez's, the Da Leyvas and Mendozas may have deserved their fall; but when they fell, and no others had arisen in their places, the nation fell also.

Hitherto no great state has been able to sustain itself in a front place without aristocracy of some kind maintained on the hereditary principle. On this point the answer of history is uniform. The United States may inaugurate a new experience. With the one exception of the Adams's, the great men who have shown as yet in American history have no representatives to stand at present in the front political ranks. There are no Washingtons, no Franklins, no Jeffersons, no Clays or Randolphs, now governing States or leading debates in Congress. How long this will continue, how long the determination that all men shall start equal in the race of life will prevail against the instinctive tendencies of successful men to perpetuate their names, is the most interesting of political problems. The American nationality is as yet too young for conclusions to be built on what it has done hitherto, or has forborne to do. We shall know better two centuries hence whether equality and the ballot-box provide better leaders for a people than the old methods of birth and training. France was cut in pieces in the revolution of 1793, and flung into the Medean caldron, expecting to emerge again with fresh vitality. The rash experiment has not succeeded up to this time, and here too we must wait for what her future

See [illegible]

will bring forth. So far the nations which have democratized themselves have been successful in producing indefinite quantities of money. If money and money-making will secure their stability, they may look forward hopefully—not otherwise.

We, too, have travelled far on the same road. We can continue to say, 'Thank God we have still a House of Lords,' but it is a House of Lords which is allowed to stand with a conditional tenure. It must follow, it must not lead, the popular will. It has been preserved rather as an honoured relic of a state of things which is passing away, than as representing any actual forces now existing. We should not dream of creating a hereditary branch of legislature if we had to begin over again; being there, we let it remain as long as it is harmless. Nevertheless, great families have still a hold upon the country, either from custom or from a sense of their value. Fifty years are gone since the great democratic Reform Bill, yet the hereditary peers must still give their consent to every law which passes. Their sons and cousins form a majority in the House of Commons, and even philosophic Radicals doubt if the character of the House would be improved without men there whose position in society is secured, and who can therefore afford to be patriotic.

How long a privileged order will hold its ground against the tendencies of the age depends upon itself, and upon the objects which it places before itself. If those who are within the lines retain, on the whole, a superior tone to those outside, and if access to the patrician order is limited to men who have earned admission there by real merit, the Upper House will be left in spite of ballot and universal suffrage, or perhaps by means of them, for generations to come. But the outlook is not without its ugly features, and should anything happen to stir the passions of the people as they were stirred half a century ago, the English peerage would scarcely live through another storm.

Whatever future may be in store for them, the past at any rate is their own, and they are honourably proud of it. The Roman preserved in his palace the ashes of his titled ancestors, and exhibited their images in his saloons. The English noble hangs the armour which was worn at Flodden or at Crecy in his ancestral hall. The trophies and relics of generations are among the treasures of his family. The stately portraits of his sires look down upon him from the walls of his dining-room. When he dies his desire is, like the prayer of the Hebrews, to be buried in the sepulchre of his fathers. There only is the fitting and peaceful close of a life honourably spent. There the first founder of the family and his descendants rest side by side, after time has ceased for each of them, to be remembered together by the curious who spell through their epitaphs, and to dissolve themselves into common dust. Occasionally, as a more emphatic memorial, the mausoleum becomes a mortuary chapel attached to some parish church or cathedral. The original purpose was of course that a priest, specially appointed, should say masses there immediately close to the spot where their remains were lying. The custom has outlived the purpose of it, and such chapels are to be met with in Protestant countries as often as in Catholic. The most interesting that I ever saw is that of the Mendozas in the cathedral at Burgos. It is the more affecting because the Mendozas have ceased to exist. Nothing survives of them save their tombs, which, splendid as they are, and of the richest materials, are characteristically free from meretricious ornament. There lie the figures of the proudest race in the whole nobility of Spain; knight and lady, prelate and cardinal. The stories of the lives of most of them are gone beyond recovery, and yet in those stone features can be read character as pure and grand as ever did honour to humanity. If a single family could produce so magnificent a group, we cease to wonder how Spain was once the sovereign of Europe, and the Spanish Court the home of courtesy and chivalry.

Next in interest to the monuments of the Mendozas, and second to them only because the Mendozas themselves are gone, are the tombs of the house of Russell in the chapel at Cheneys, in Buckinghamshire. The claims of the Russells to honourable memory the loudest Radical will acknowledge. For three centuries and a half they have led the way in what is called progress. They rose with the Reformation. They furnished a martyr for the Revolution of 1688. The Reform Bill is connected for ever with the name of Lord John. To know the biographies of the dead Russells is to know English history for twelve generations; and if the progress with which we are so delighted leads us safely into the Promised Land, as we are bound to believe that it will, Cheneys ought to become hereafter a place of pious pilgrimage.

The village stands on a chalk hill rising from the little river Ches, four miles from Rickmansworth, on the road to Amersham. The estate belongs to the Duke of Bedford, and is pervaded by an aspect of serene good manners, as if it was always Sunday. No vulgar noises disturb the general quiet. Cricket may be played there, and bowls and such games as propriety allows—but the oldest inhabitant can never have heard an oath spoken aloud, or seen a drunken man. Dirt and poverty are equally unknown. The houses, large and small, are solid and substantial, built of red brick, with high chimneys and pointed gables, and well-trimmed gardens before the doors. A Gothic fountain stands in the middle of the village green, under a cluster of tall elms, where picturesque neatly-dressed girls go for the purest water. Beyond the green a road runs, on one side of which stands the church and the parsonage, on the other the remains of the once spacious manor house, which was built by the first Earl of Bedford on the site of an old castle of the Plantagenet kings. One wing of the manor house only survives, but so well constructed, and of material so admirable, that it looks as if it had been completed yesterday. In a field under the window is an oak which tradition says was planted by Queen Elizabeth Bess. More probably it is as old as the Conquest. The entire spot, church, mansion, cottages, and people, form a piece of ancient England artificially preserved from the intrusion of modern ways. No land is let on building lease in Cheneys to be disfigured by contractors' villas. No flaring shops, which such villas bring behind them, make the street hideous. A single miscellaneous store supplies the simple wants of the few inhabitants—the bars of soap, the bunches of dip candles, the tobacco in ounce packets, the tea, coffee, and sugar, the balls of twine, the strips of calico. Even the bull's-eyes and gingerbread for the children are not unpermitted, if they are honestly made and warranted not to be poisonous. So light is the business that the tidy woman who presides at the counter combines with it the duties of the post-office, which again are of the simplest kind. All is old-fashioned, grave, and respectable. No signs are to be found of competition, of the march of intellect, of emancipation, of the divine right of each man and woman to do what is good in their own eyes—of the blessed liberty which the House of Russell has been so busy in setting forward. The inhabitants of Cheneys live under authority. The voice of the Russells has been the voice of the emancipator—the hand has been the hand of the ruling noble.

The Manor House contains nothing of much interest. In itself, though a fragment, it is a fine specimen of the mason work of the Tudor times, and if not pulled down will be standing strong as ever when the new London squares are turned to dust heaps. With its high-pitched roofs and its clusters of curiously twisted chimneys it has served as a model for the architecture of the village, the smallest cottages looking as if they had grown from seeds which had been dropped by the central mansion.

All this is pretty enough, but the attraction of the place to a stranger is the church and what it contains. I had visited it before more than once, but I wished to inspect the monuments more closely. I ran down from London, one evening in June, to the village inn, and in the morning, soon after sunrise, when I was in less danger of having the officious assistance thrust upon me of clerk or sexton, I sauntered over to see if I could enter. The keys were kept at an adjoining cottage. The busy matron was already up and at her work. When I told her that I had special permission she unlocked the church door and left me to myself. Within, as without, all was order. No churchwardens, it was plain enough, had ever been allowed to work their will at Cheneys. Nay, the unchallenged loyalty of the Bedford family to constitutional liberty must have saved the Church from the visits of the Commissioners of the Long Parliament. On the walls are old Catholic brasses, one representing a parish priest of the place with the date of 1512, and a scroll praying for mercy on his soul. Strange to think that this man had said mass in the very place where I was standing, and that the memory of him had been preserved by the Russells, till the wheel had come round again and a Catholic hierarchy had been again established in England, with its Cardinals and Archbishops and Bishops. Will mass be ever said in Cheneys again?—not the sham mass of the Ritualists, but the real thing? Who that looks on England now can say that it will not? And four miles off is Amersham, where John Knox used to preach, and Queen Mary's inquisitors gathered their batches of heretics for Smithfield. On the pavement against the wall lies a stone figure of an old knight, finished only from the waist upwards. The knight is in his armour, his wife rests at his side; the hands of both of them reverently folded. Opening from the church on the north side, but private and not used for service, is the Russell Chapel. Below is the vault where the remains lie of most of the family who have borne the name for three centuries and a half.

On a stone tablet over the east window are the words 'This Chapel is built by Anne, Countess of Bedford, wife to John, Earl of Bedford, A.D. 1556.' It was the year in which Queen Mary was most busy offering her sacrifices to persuade Providence to grant her an heir. The chapel, therefore, by a curious irony, must have been consecrated with Catholic ceremonies.

The earliest monument is the tomb of this Lady Anne[1] and her husband, and is one of the finest of its kind in Europe. The material is alabaster; the pink veins in the stone being abundant enough to give a purple tint to the whole construction. The workmanship is extremely elaborate, and belongs to a time when the temper of men was still manly and stern, and when the mediæval reverence for death was still unspoiled by insincerity and affectation. The hands are folded in the old manner. The figures are not represented as sleeping, but as in a trance, with the eyes wide open. The faces are evidently careful likenesses; the Earl has lost an eye in action—the lid droops over the socket as in life. His head rests on his corslet, his sword is at his side. He wears a light coronet and his beard falls low on his breast. The features do not denote a man of genius, but a loyal and worthy servant of the State, cautious, prudent, and thoughtful. The lady's face is more remarkable, and it would seem from the pains which have been taken with it that the artist must have personally known and admired her, while the Earl he may have known only by his portrait. The forehead of the Lady Anne is strong and broad, the nose large, the lips full but severely and expressively closed. She looks upward as she lies, with awe, but with a bold heart, stern as a Roman matron. The head is on a cushion, but the Earl's baldric would have formed as suitable a pillow for a figure so commanding and so powerful. It is a pity that we know so little of this lady. She was the daughter of Sir Guy Sapcote, of Huntingdonshire. Her mother was a Cheney, and through her the Cheneys estate fell to its present owners. She had been twice married and twice a widow when her hand was sought by Sir John Russell. At that time she was in the household of Catherine of Arragon; but she had no liking for the cause which Catherine represented, or for Catherine's daughter either. She died while Mary was still on the throne, but in her will she gave a significant proof that she at least had not bowed the knee when Baal was brought in again. She bequeathed her soul to Almighty

---

[1] Through some blunder, she is described on the monument as Lady Elizabeth.

God, 'trusting only by the death and passion of his dear Son, Jesus Christ, to be saved.' This is all that can be said of the 'mighty mother' of the Russells to whose side they are gathered as they fall; but if the stern portrait speaks truth, her sons have inherited gifts from her more precious by far than the broad lands in Bedford and Huntingdon.

The Russells, or Rozels, are on the Battle Roll as having come from Normandy with the Conqueror. They played their part under the Plantagenets, not without distinction, and towards the end of the fifteenth century were a substantial family settled at Barwick, in Dorsetshire. In the year 1506, John, son and heir of the reigning head of the house, had returned from a tour on the continent, bringing back with him accomplishments rare at all times with young proud Englishmen, and at that day unheard of save among the officially-trained clergy. Besides his other acquisitions he could speak French, and probably German. It happened that in that winter the Archduke Philip, with his mad wife Joanna, sister of Catherine of Arragon, was on his way from the Low Countries to Spain. As he was going down channel he was driven by a gale into Weymouth, and having been extremely sea-sick, he landed to recover himself. Foreign princes are a critical species of guest. The relations of Henry VII. with Joanna's father, Ferdinand, were just then on a doubtful footing. Prince Arthur was dead. Catherine was not yet married to his brother Henry, nor was it at all certain that she was to marry him; and when so great a person as the Archduke, and so nearly connected with Ferdinand, had come into England uninvited, the authorities in Dorsetshire feared to let him proceed on his voyage till their master's pleasure was known. A courier was despatched to London, and meanwhile Sir Thomas Trenchard, the most important gentleman in the neighbourhood, invited the whole party to stay with him at Wolverton Hall. Trenchard was Russell's cousin. His own linguistic capabilities were limited, and he sent for his young kinsman to assist in the royal visitors' entertainment. Russell went, and made himself extremely useful. Henry VII. having pressed the Archduke to come to him at Windsor, the Archduke carried his new friend along with him, and spoke so warmly of his talents and character to the king that he was taken at once into the household. So commenced the new birth of the Russell house. Most men have chances opened to them at one time or another. Young for any kind of service, either with pen or sword, brain or hand. He went with Henry VIII. to his first campaign in France. He was at the siege of Thérouenne, and at the battle of the Spurs. For an interval he was employed in political negotiations. Then we find him one of sixteen English knights who held the lists against all comers at Paris on the marriage of Louis XII. with the Princess Mary. In the war of 1522 he lost his eye at the storming of Morlaix, and was knighted for his gallantry there. Immediately afterwards he was employed by Henry and Wolsey on an intricate and dangerous service. Louis XII. was dead. The friendship between England and France was broken, and Henry and his nephew, the Emperor Charles V., were leagued together against the young Francis. Charles was aiming at the conquest of Italy. Henry had his eye on the French crown, which he dreamt of recovering for himself. Francis had affronted his powerful kinsman and subject, the Duke of Bourbon. Bourbon had intimated that if England would provide him with money to raise an army, he would recognize Henry as his liege lord, and John Russell was the person sent to ascertain whether Bourbon might be trusted to keep his word. Russell, it seems, was satisfied. The money was provided and was committed to Russell's care, and the great powers of Europe made their first plunge into the convulsions which were to last for more than a century. Little did Henry and Charles know what they were doing, or how often they would change partners before the game was over. Bourbon invaded Provence, Sir John Russell attending upon him with the English treasure. The war rolled across the Alps, and Russell saw the great battle fought at Pavia, where France lost all save honour, and the French king was the prisoner of the Emperor.

Then, if ever, was the time for Henry's dream to have been accomplished; but it became too clear that the throne of France was not at Bourbon's disposition, and that even if he had been willing and able to keep his word the Emperor had no intention of allowing him to keep it. Henry and Wolsey had both been foiled in the object nearest to their hearts, for Henry could not take the place of Francis, and Wolsey, who had meant to be pope, saw the Cardinal de Medici chosen instead of him. So followed a shift of policy. Charles V. was now the danger to the rest of Europe. Henry joined himself with France against his late ally. Francis was to be liberated from his Spanish prison, and was to marry Henry's daughter. Catherine of Arragon was to be divorced, and Henry was to marry a French princess, or some one else in the French interest. The adroit Russell in Italy was to bring Milan, Venice, and the Papacy into the new confederacy. An ordinary politician looking then at the position of the pieces on the European chess-board, would have said that Charles, in spite of himself, would have been compelled to combine with the German princes, and to take up the cause of the Reformation. The Pope was at war with him. Clement, Henry, and Francis were heartily friends. Henry had broken a lance with Luther. Bourbon's army, which had conquered at Pavia, was recruited with lanzknechts, either Lutherans or godless ruffians. Bourbon's army was now Charles's; and food being scanty and pay not forthcoming, the duke was driven, like another Alaric, to fling himself upon Rome, and storm and plunder the imperial city. It is curious and touching to find Clement clinging in such a hurricane to England and Henry as his surest supports. Russell had been staying with him at the Vatican on the eve of the catastrophe. He had gone home before the Germans approached, and missed being present at the most extraordinary scene in the drama of the sixteenth century, when the Holy Father, from the battlements of St. Angelo, saw his city sacked, his churches pillaged, his sacred sisterhoods outraged, his cardinals led in mockery on asses' backs through the streets by wild bands, acting under the order, or in the name, of the most Catholic King.

An attitude so extravagant could not endure. A little while, and the laws of spiritual attraction had forced the various parties into more appropriate relations. The divorce of Catherine went forward; the Pope fell back on Catherine's Imperial nephew. England broke with the Holy See, and the impulses which were to remodel the modern world flowed into their natural channels. Russell's friend, Thomas Cromwell, became Henry's chief minister; and Russell himself, though the scheme he had been employed to forward had burst like a bubble, still rose in his sovereign's confidence. He was at Calais with Henry in 1532 when Anne Boleyn was publicly received by Francis. He was active in the suppression of the monasteries, and presided at the execution of the Abbot of Glastonbury. Again, when Anne Boleyn fell into disgrace, Russell, who was now Privy Seal, was appointed with her uncle, the Duke of Norfolk, to examine into the charges against her. Through all the changes of Henry's later years, when the scaffold became so near a neighbour of the Royal closet, Russell remained always esteemed and trusted. At the birth of the young Edward he was made a peer, as Baron Russell of Cheneys. The year after he received the Garter. As Warden of the Stannaries he obtained the lands and mines of the suppressed Abbey of Tavistock. When his old master died he was carried on with the rising tide of the Reformation; he took Miles Coverdale for his chaplain, and obtained the Bishopric of Exeter for him. At his house in the Strand was held the conference on the Eucharist, when the strangest of all human superstitions was banished for a time from the English liturgy. Lord Russell's vigorous hand suppressed the Catholic rebellion in Devonshire. The Earldom of Bedford came next. His estates grew with his rank. Woburn Abbey fell to him on easy terms, for the Lords of the Council were first in the field, and had the pick of the spoil. Faction never tempted him out of the even road. He kept aloof from the quarrels of the Seymours and the Dudleys. When Somerset was attainted, the choicest morsel of Somerset's forfeited estates—Covent Garden and 'the seven acres' —was granted to the Earl of Bedford. Edward's

M. R. JAYAKAR
MALABAR HILL
BOMBAY

death was a critical moment. Bedford, like the rest of his Council, signed the instrument for the succession of Lady Jane Grey. Like the rest, he changed his mind when he saw Lady Jane repudiated by the country. The blame of the conspiracy was thrown on the extreme Protestant faction. The moderate Liberals declared for Mary, and by retaining their places and their influence in the Council set limits to the reaction, and secured the next succession to Mary's sister. Mary's government became Catholic, but Russell continued Privy Seal. A rebellion broke out in Devonshire; this time a Protestant one. Bedford was the person who put it down. His last public act was to go with Lord Paget to Spain to bring a Spanish husband home for his queen. He sailed with Philip from Corunna. He was at the memorable landing at Southampton, and he gave away his mistress at the marriage at Winchester. A few months later he died, after fifty years of service in the most eventful period of modern English history. His services were splendidly rewarded, and he has been reproached in consequence as a trimmer and a time-server. But revolutions are only successful when they advance on a line lying between two extremes, and resulting from their compound action. To be a trimmer at such a time is to have discerned the true direction in which events are moving, and to be a wise man in whom good sense is stronger than enthusiasm. John Russell's lot was cast in an era of convulsion, when Europe was split into hostile camps, when religion was a shuttlecock of faction, Catholics and Protestants, as they were alternately uppermost, sending their antagonists to stake or scaffold. Russell represented the true feeling of the majority of Englishmen. They were ready to move with the age, to shake off the old tyranny of the Church, to put an end to monastic idleness, and to repudiate the authority of the Pope. But they had no inclination to substitute dogmatic Protestantism for dogmatic Catholicism. They felt instinctively that theologians knew but little, after all, of the subject for which they were so eager to persecute each other, and that the world had other interests beside those which were technically called religious; and on one point through all that trying time they were specially determined, that they would have no second war in England of rival Roses, no more fields of Towton or Barnet. They would work out their reformation, since a reformation there was to be, within the law and by the forms of it, and if enthusiasts chose to break into rebellion, or even passively to refuse obedience to the law like More or Fisher, they might be admired for their generous spirit, but they were struck down without hesitation or mercy. Who shall say that the resolution was not a wise one, or that men who acted upon it are proper objects of historical invective?

The mission to Spain rounds off John Russell's story. It commenced with his introduction to Philip's grandfather. It ended with Philip's marriage to the English Queen. Throughout his life his political sympathies were rather Imperial than French, as English feeling generally was. He was gone before the Marian persecution assumed its darker character; and until the stake became so busy, a wise liberal statesman might reasonably have looked on Mary's marriage with her cousin as promising peace for the country, and as a happy ending of an old quarrel.

Lady Anne lived to complete the Cheneys chapel; she died two years after her husband, and the Russells were then threatened with a change of fortune. The next Earl, Francis—Francis 'with the big head'—was born in 1528. His monument stands next that of his father and mother, and is altogether inferior to it. The two figures, the Earl himself and the Countess Margaret, are of alabaster like the first, and though wanting in dignity, are not in themselves wholly offensive; but according to the vile taste of the seventeenth century, they are tawdrily coloured in white and red and gold, and are lowered from the worthiness of sculpture to the level of a hair-dresser's model or of the painted Highlander at the door of a tobacco shop. Piety in England had by this time passed over to the Puritans, and Art, divorced from its proper inspiration, represented human beings as no better than wearers of State clothes. The Earl 'with the big head' deserves a more honourable portrait of himself, or deserves at least that the paint should be washed off. He was brought forward early in public life. He was Sheriff of Bedfordshire when he was nineteen. He sate in the Parliament of 1553, when the Prayer-book was purged of idolatry. In religion, taught perhaps by his mother, he was distinctly Protestant, and when his father died he was laid hold of as suspect by Gardiner. He escaped and joined the English exiles at Geneva. At the accession of Elizabeth he was called home, restored to his estates, and placed on the Privy Council, and when it pleased Mary Stuart, then Queen of France, to assume the royal arms of England, and declare herself the rightful owner of the English crown, the Earl of Bedford was sent to Paris to require that ambitious lady to limit those dangerous pretensions and to acknowledge her cousin's right.

Here it was that Bedford began his acquaintance with Mary Stuart; an acquaintance which was to be renewed under more agitating conditions. At Geneva, he had been intimate with the leading Reformers, Scotch as well as English. When Mary began her intrigues with the Catholic party in England, Bedford was sent to Berwick as Governor, where he could keep a watch over her doings, and be in constant communication with Knox and Murray. He received and protected Murray at the time of the Darnley marriage. Ruthven fled to him after the murder of Rizzio; and from Ruthven's lips Bedford wrote down the remarkable despatch, describing the details of the scene in that suite of rooms at Holyrood which has passed into our historical literature.

The Queen of Scots was regarded at this time by the great body of the English people as Elizabeth's indisputable heir. Catholic though she might be, her hereditary right was respected as Mary Tudor's had been, and had Elizabeth died while Darnley was alive, she would have succeeded as easily as James succeeded afterwards. When James was born he was greeted on his arrival in this world as a Prince of the Blood Royal, and Bedford was sent to Stirling to the christening with fine presents and compliments from his mistress. The shadow of the approaching tragedy hung over the ceremony. Bedford was conducted to the nursery to see the child in his cradle. Among the gifts which he had brought was a font of gold, which held the water in which James was made a Christian. Mary, in return, hung a chain of diamonds on Bedford's neck; never missing an opportunity of conciliating an English noble. But the English ambassador was startled to observe that the Queen's husband seemed of less consideration in her Court than the meanest footboy. The Queen herself scarce spoke to him; the courtiers passed him by with disdain. Bedford set it down to the murder of Rizzio, which he supposed to be still unforgiven, and he gave Mary a kindly hint that the poor wretch had friends in England whom in prudence she would do well to remember. Two months after came Kirk o' Field, and then the Bothwell marriage, Carberry Hill, Lochleven, Langside, the flight to England, the seventeen years in which the caged eagle beat her wings against her prison bars; and, finally, the closing scene in the hall at Fotheringay.

As his father had supported the rights of Mary

Tudor, so the second Earl would have upheld the rights of Mary Stuart till she had lost the respect of the country. But after Darnley's death the general sense of England pronounced her succession to be impossible. Bedford stood loyally by his own mistress in the dangers to which she was exposed from the rage of the disappointed Catholics. He was not one of the Lords of the Council who were chosen to examine the celebrated Casket letters, for he was absent at Berwick; but he sate on the trial of the Duke of Norfolk, and he joined in sending him to the scaffold. He died in 1585, two years before Mary Stuart's career was ended, but not before it was foreseen what that end must be. One other claim must not be forgotten which the second Earl possesses upon the memory of Englishmen. The famous Drake was born upon his estate at Tavistock. The Earl knew and respected his parents, and was godfather to their child, who derived from him the name of Francis. It was strange to feel that the actual remains of the man who had played a part in these great scenes were lying beneath the stones half a dozen yards from me. He sleeps sound, and the jangle of human discord troubles him no more.

He had two sons, neither of whom is in the vaults at Cheneys. Francis, the eldest, was killed while his father was alive, in a skirmish on the Scotch border. William fought at Zutphen by the side of Philip Sydney. For five years he was Viceroy of Ireland, which he ruled at least with better success than Essex, who came after him. This William was made Lord Russell of Thornhaugh, and brought a second peerage into the family. Their sister Anne was married to Ambrose Dudley, Earl of Warwick, the brother of Elizabeth's Leicester.

The third Earl, Edward, was the son of Francis who was killed in the north, and succeeded his grandfather when a boy of eleven. In him the family genius slept. He lived undistinguished and harmless, and died in 1627, having left unfulfilled even the simple duty of begetting an heir. He was followed by his cousin Francis, son of his uncle, Lord Thornhaugh, and the divided houses again became one.

This Francis was called the wise Earl. He was a true Russell, zealous for the Constitution and the constitutional liberties of England. He had been bred a lawyer, and understood all the arts of Parliamentary warfare. At the side of Eliot, and Pym, and Selden, he fought for the Petition of Right, and carried it by his own energy through the House of Lords. Naturally he made himself an object of animosity to the Court, and he was sent to the

Tower as a reward of his courage. They could not keep him as they kept Eliot, to die there. He was released, but the battle had to be waged with weapons which a Russell was not disposed to use. When he was released Parliamentary life in England was suspended. There was no place for a Russell by the side of Laud and Strafford, and Bedford set himself to improve his property and drain the marshes about Whittlesea and Thorney. If solid work well done, if the addition of hundreds of thousands of acres to the soil available for the support of English life, be a title to honourable remembrance, this Earl ranks not the lowest in the Cheneys pantheon. He and his countess lie in the vault, with several of their children who died in childhood; they are commemorated in a monument not ungraceful in itself, were not it too daubed with paint and vulgarized by gilding. One of the little ones is a baby, a bambino swaddled round with wrappings which had probably helped to choke the infant life out of it.

The wise Earl died immediately after the opening of the Long Parliament. William Russell, his eldest son, had been returned to the House of Commons along with Pym as member for Tavistock. The Bedford interest doubtless gave Pym his seat there.

His father's death removed him from the stormy atmosphere of the Lower House, and he was unequal to the responsibilities which his new position threw upon him. Civil war was not a theatre on which any Russell was likely to distinguish himself, and Earl William less than any of them. The old landmarks were submerged under the deluge. He was washed from side to side, fighting alternately in the field for King and Parliament. He signed the Covenant in 1645, but he found Woburn a pleasanter place than the council chamber, and thenceforward, till Cromwell's death, he looked on and took little part in public life. Charles twice visited him; once on his way back to Oxford after his failure at Chester, and again in 1647 when he was in the hands of the army, then quartered between Bedford and St. Albans. It was at the time of the army manifesto, when the poor King imagined that he could play off Cromwell against the Parliament, and in fact was playing away his own life. After the negotiations were broken off, Charles went from Woburn to Latimers, a place close to Cheneys, from the windows of which, in the hot August days, he must have looked down on the Cheneys valley and seen the same meadows that now stretch along the bottom, and the same hanging beech woods, and the same river sparkling among its flags and rushes, and the cattle standing in the shallows. The world plunges on upon its way; generation follows generation, playing its part, and then ending. The quiet earth bears with them one after the other, and while all else changes, itself is changed so little.

This Earl was memorable rather from what befell him than from anything which he did. He was the first duke and he was the father of Lord William, whom English constitutional history has selected to honour as its chief saint and martyr. The Russells were not a family which was likely to furnish martyrs. They wanted neither courage, nor general decision of character, but they were cool and prudent; never changing their colours, but never rushing on forlorn hopes, or throwing their lives away on ill-considered enterprises.

Lord William, or Lord Russell, as he should be called, had perhaps inherited some exceptional quality in his blood. His mother was the beautiful Anne Carr, daughter of Carr, Earl of Somerset, the favourite of James I., and of Frances Howard, the divorced wife of the Earl of Essex, the hero and heroine of the great Oyer of poisoning, with its black surroundings of witchcraft and devilry. The old Earl Francis had sate upon their trial. He had been horrified when his son had proposed to marry the child of so ominous a pair. But Lady Anne was not touched by the crimes of her parents. Her loveliness shone perhaps the more attractively against so dark a background. Her character must have been singularly innocent, for she grew up in entire ignorance that her mother had been tried for murder. The family opposition was reluctantly withdrawn, and young Russell married her.

This pair, Earl William—afterwards Duke—and the Lady Anne Carr, are the chief figures in the most ostentatious monument in the Russell chapel. They are seated opposite each other in an attitude of violent grief, their bodies flung back, their heads buried in their hands in the anguish of petrified despair. They had many children, medallions of whom are ranged on either side in perpendicular rows. In the centre is the eldest—the occasion of the sorrow so conspicuously exhibited—whose head fell in Lincoln's Inn Fields. The execution of this medallion is extremely good; the likeness—if we may judge from the extant portraits of Lord Russell—is very remarkable. The expression is lofty and distinguished, more nearly resembling that of the first Countess than that of any of her other descendants; but there is a want of breadth, and the features are depressed and gloomy. It is a noble face, yet a face which tells of aspirations and convictions unaccompanied with the force which could carry them out into successful action. It stands with a sentence of doom upon it, the central object in a group of sculpture which, as a whole, is affected and hysterical. A man so sincere and so honourable deserves a simpler memorial, but it is not uncharacteristic of the pretentiousness and unreality which have been the drapery of the modern Whigs—their principles good and true in themselves, but made ridiculous by the extravagance of self-laudation.

Lord Russell's wife is a beautiful figure in the story, and she lies by his side in the Cheneys vault. She was Rachel Wriothesley, daughter of Lord Southampton; her mother being a De Rouvigny, one of the great Huguenot families in France. The tragedy of Lord Russell scarcely needs repeating. The Restoration was an experiment, to try whether the liberties of England were compatible with the maintenance of a dynasty which was Catholic at heart, and was for ever leaning as far as the times would permit to an avowal of Catholic belief. Charles II. had been obliged to hide his real creed, and pretend to Protestantism as a condition of his return. But the Catholic party grew daily stronger.

Russell led the opposition in Parliament. to the bottom of his heart in the old English dread and hatred of Popery. He impeached Buckingham and Arlington. He believed to the last in the reality of the Popish plot, and he accepted Oates and Dangerfield as credible witnesses. He carried a Bill prohibiting Papists from sitting in Parliament. If Papists could not sit in Parliament, still less ought they to be on the throne, and the House of Commons, under his influence, passed the Exclusion Bill, cutting off the Duke of York. Russell carried it with his own hands to the House of Lords, and session after session, dissolution after dissolution, he tried to force the Lords to agree to it. No wonder that the Duke of York hated him, and would not spare him when he caught him tripping. When constitutional opposition failed, a true Russell would have been content to wait. But the husband of Lady Rachel drifted into something which, if not treason, was curiously like it, and under the shadow of his example a plot was formed by ruder spirits to save the nation by killing both the Duke and the King. Lord Russell was not privy to the Rye House affair, but he admitted that he had taken part in a whom the country was to be on its guard was the heir to the crown.

Martyrs may be among the best of men, but they are not commonly the wisest. To them their particular theories or opinions contain everything which makes life of importance, and no formula ever conceived by man is of such universally comprehensive character that it must be acted upon at all hazards and regardless of time and opportunity. The enthusiast imagines that he alone has the courage of his convictions; but there is a faith, and perhaps a deeper faith, which can stand still and wait till the fruit is ripe, when it can be gathered without violence. Each has its allotted part. The noble generous spirit sacrifices itself and serves the cause by suffering. The indignation of the country at the execution of Sydney and Russell alienated England finally and fatally from the House of Stuart. Lord Russell and his friend were canonized as the saints of the Revolution, but the harvest itself was gathered by statesmen of more common clay, yet perhaps better fitted for the working business of life.

Lord Russell's trial was attended with every feature which could concentrate the nation's attention upon it. The Duke of York was the actual and scarcely concealed prosecutor. Lady Rachel appeared in court as her husband's secretary. It is idle to say that he was unjustly convicted. He was privy to a scheme for armed resistance to the Government, and a Government which was afraid to punish him ought to have abdicated. Charles Stuart had been brought back by the deliberate will of the people. As long as he was on the throne he was entitled to defend both himself and his authority. Lord Russell was not, like Hampden, resisting an unconstitutional breach of the law. He was taking precautions against a danger which he anticipated, but which had not yet arisen. A Government may be hateful, and we may admire the courage which takes arms against it; but the Government, while it exists, is not to be blamed for protecting itself with those weapons which the law places in its hands.

He died beautifully. Every effort was made to save him. His father pleaded his own exertions in bringing about the Restoration. But the Duke of York was inexorable, and Lord Russell was executed. The Earl was consoled after the Revolution with a dukedom. His mother, Lady Anne, did not live to recover from the shock of her son's death. In the midst of her wretchedness she found accidentally in a room in Woburn a pamphlet with an account of the Overbury murder. For the first time she learnt the dreadful story. She was found senseless, with her hand upon the open page, and never rallied from the blow.

Lady Rached lived far into the following century, and was a venerable old lady before she rejoined her husband. Once at least while alive Lady Rachel visited Cheneys Chapel. Her foot had stood on the same stones where mine were standing; her eyes had rested on the same sculptured figures.

'I have accomplished it,' she wrote, 'and am none the worse for having satisfied my longing mind, and that is a little ease—such degree of it as I must look for. I had some business there, for that to me precious and delicious friend desired I would make a little monument for us, and I had never seen the place. I had set a day to see it with him not three months before he was carried thither, but was prevented by the boy's illness.'

'She would make a little monument.' And out of that modest hope of hers has grown the monstrous outrage upon taste and simplicity, which we may piously hope was neither designed nor approved by the admirable Lady Rachel.

Lord Russell had pressed his devotion to the cause of liberty beyond the law; another Russell has been accused of treason to the sacred traditions of the family. Edward, the youngest brother of the fourth Earl Francis, who lies with the rest at Cheneys, had a son, who was one of the few Russells that were famous in arms—the admiral who won the battle of La Hogue, saved England from invasion, and was rewarded with the Earldom of Orford. Admiral Russell, like Marlborough, notwithstanding his brilliant services, was beyond doubt in correspondence with the Court of St. Germains, and equally beyond doubt held out hopes to the banished King that he might desert William and carry the fleet along with him. The real history of these mysterious transactions is unknown, and, perhaps, never will be known. William was personally unpopular. His manner was ungracious. He was guilty of the unpardonable sin of being a foreigner, which Englishmen could never forgive. A restoration like that of Charles II. seemed at one time, at least, one of the chances which were on the cards—and cautious politicians may not have felt they were committing any serious violation of trust in learning directly from James the securities for rational liberty which he was ready to concede. The negotiation ended, however, in nothing—and it is equally likely that it was intended to end in nothing. James's own opinion was that 'Admiral Russell did but delude the King with the Prince of Orange's permission.' It is needless to speculate on the motives of conduct, which, if we knew them, we should be unable to enter into. To the student who looks back over the past, the element of uncertainty is eliminated. When the future, which to the living man is contingent and dim, obscuring his very duties to him, has become a realized fact, no effort of imagination will enable the subsequent inquirer to place himself in a position where the fact was but floating possibility. The services both of Churchill and Russell might be held great enough to save them from the censure of critics, who, in their arm-chairs at a distance of two centuries, moralize on the meannesses of great men.

The Admiral, at any rate, is not among his kindred in the Cheneys vault. He was buried at his own home, and his peerage and his lineage are extinct.

The Dukedom has made no difference in the attitude of the Bedford family. A more Olympian dignity has surrounded the chiefs of the house, but they have continued, without exception, staunch friends of liberty; advocates of the things called Reform and Progress, which have taken the place of the old Protestant cause; and the younger sons have fought gallantly like their forefathers in the front ranks of the battle. We may let the dukes glide by wearing the honours which democracy allows to stand, because they are gradually ceasing to have any particular meaning. We pass on to the last Russell for whom the vault at Cheneys has unlocked 'its marble jaws;' the old statesman who filled so large a place for half a century in English public life, whose whole existence from the time when he passed out of childhood was spent in sharp political conflict, under the eyes of the keenest party criticisms, and who carried his reputation off the stage at last, unspotted by a single act which his biographers were called on to palliate.

To the Tories, in the days of the Reform Bill, Lord John Russell was the tribune of an approaching violent revolution. To the Radicals he was the Moses who was leading the English nation into the promised land. The alarm and the hope were alike imaginary. The wave has gone by, the crown and peerage and church and primogeniture stand where they were, and the promised land, alas! is a land not running with corn and wine, but running only with rivers of gold, at which those who drink are not refreshed. To the enthusiasts of Progress the Reform Bill of 1832 was to be a fountain of life, in which society was to renew its youth like the eagle. Highborn ignorance was to disappear from the great places of the nation; we were to be ruled only by Nature's aristocracy of genius and virtue; the inequalities of fortune were to be readjusted by a truer scale; and merit, and merit only, was to be the road to employment and distinction. We need not quarrel with a well-meant measure because foolish hopes were built upon it. But experienced men say that no one useful thing has been done by the Reformed Parliament which the old Parliament would have refused to do; and for the rest, it begins to be suspected that the reform of which we have heard so much is not the substitution of a wise and just government for a government which was not wise and just, but the abolishment of government altogether, and the leaving each individual man to follow what he calls his interest—a process under which the English people are becoming a congregation of contending atoms, scrambling every one of them to snatch a larger portion of good things than its fellow.

It is idle to quarrel with the inevitable. Each generation has its work to do. Old England could continue no longer; and the problem for the statesmen of the first half of this century was to make the process of transformation a quiet and not a violent one. The business of Lord John Russell was to save us from a second edition of the French Revolution; and if he thought that something higher or better would come of it than we have seen, or are likely to see, it is well that men are able to indulge in such pleasant illusions to make the road the lighter for them. The storms of his early life had long passed away before the end came. He remained the leader of the Liberal party in the House of Commons during the many years in which the administration was in the Liberal hands; and he played his part with a prudence and good sense, of which we have been more conscious, perhaps, since the late absence of these qualities. Lord John Russell (or Earl Russell as he became) never played with his country's interests for the advantage of his party. Calumny never whispered a suspicion either of his honour or his patriotism, and Tory and Radical alike followed him when he retired with affectionate respect. In Cheneys church there is no monument of him. His statue will stand appropriately in the lobby of the House, where he fought and won his many battles. It may be said of him, as was said of Peel, that we did not realize his worth till he was taken from us. In spite of progress, we have not produced another man who can make us forget his loss.

Here, too, beneath the stones, lies another pair, of whom the world spoke much, and knew but little —Earl Russell's young son, who died prematurely before his father, and that son's still younger wife. Lord Amberley also was a genuine Russell, full of talent, following truth and right wherever they seemed to lead him; and had life been allowed him he too would have left his mark on his generation. He was carried away, it was said, into extreme opinions. It is no unpardonable crime. His father, too, in his young days, had admired Napoleon and the French Revolution; had admired many things of which in age he formed a juster estimate. We do not augur well of the two-year-old colt whose paces are as sedate as those of an established roadster, who never rears when he is mounted, or flings out his heels in the overflow of heart and spirit. Our age has travelled fast and far in new ways, tossing off traditions old as the world as if they were no better than worn-out rags; and the ardent and hopeful Amberley galloped far in front in pursuit of what he called Liberty, not knowing that it was a false phantom which he was following; not freedom at all, —but anarchy. The wise world held up its hands in horror; as if any man was ever good for anything whose enthusiasm in his youth has not outrun his understanding. Amberley, too, would have learnt his lesson had time been granted him. He would have learnt it in the best of schools—by his own experience. Happy those who have died young if they have left a name as little spotted as his with grosser faults and follies.

She, too, his companion, went along with him in his philosophy of progress, each most extravagant opinion tempting her to play with it. True and simple in herself, she had been bred in disdain of unreality. Transparent as air, pure as the fountain which bubbles up from below a glacier, she was encouraged by her very innocence in speculations against which a nature more earthly would have been on its guard. She so hated insincerity that in mere wantonness she trampled on affectation and conventionality, and she would take up and advocate theories which, if put in practice, would make society impossible, while she seemed to me as little touched by them herself as the seagull's wings are wetted when it plunges into the waves.

The singular ways of the two Amberleys were the world's wonder for a season or two. The world might as well have let them alone. The actual arrangements of things are so far from excellent that young ardent minds become Radical by instinct when they first become acquainted with the world as it actually is. Radicalism is tamed into reasonable limits when it has battered itself for a few years against the stubborn bars of fact, and the conversion is the easier when the Radical is the heir of an earldom. The Amberleys, who went farther than Lord Russell had ever done in the pursuit of imaginary Utopias, might have recoiled farther when they learnt that they were hunting after a dream. Peace be with them. They may dream on now, where the world's idle tattle can touch them no more.

The ghostly pageant of the Russells has vanished. The silent hours of the summer morning are past, and the sounds outside tell that the hamlet is awake and at its work. The quiet matron must resume the charge of the church keys, that intruders may not stray into the sanctuary unpermitted. In Catholic countries the church doors stand open; the peasant pauses on his way to the fields for a moment of meditation or a few words of prayer. The kneeling figures, on a week-day morning, are more impressive than Sunday rituals or preacher's homily. It was so once here in Cheneys, in the time of the poor priest whose figure is still on the wall. Was the Reformation, too, the chase of a phantom? The freedom of the church at all events is no longer permitted here in Protestant England. I, too, must go upon my way back to the village inn, where—for such things have to be remembered—breakfast and a young companion are waiting for me. It is worth while to spend a day at Cheneys, if only for the breakfast—breakfast on fresh pink trout from the Ches, fresh eggs, fresh yellow butter, cream undefiled by chalk, and home-made bread untouched with alum. The Russells have been the apostles of progress, but there is no progress in their own dominion. The ducal warranty is on everything which is consumed here.

The sun was shining an hour ago. It is now raining; it rained all yesterday; the clouds are coming up from the south and the wind is soft as oil. The day is still before us, and it is a day made for trout fishing. The chapel is not the only attraction at Cheneys. No river in England holds finer trout, nor trout more willing to be caught. Why fish will rise in one stream and not in another is a problem which we must wait to understand, as Bret

Harte says, in 'another and a better world.' The Ches at any rate is one of the favoured waters. Great, too, is the Duke of Bedford—great in the millions he has spent on his tenants' cottages—great in the remission of his rents in the years when the seasons are unpropitious—great in the administration of his enormous property; but greater than all in the management of his fishing, for if he gives you leave to fish there, you have the stream for the day to yourself. You are in no danger of seeing your favourite pool already flogged by another sportsman, or of finding rows of figures before you fringing the river bank, waving their long wands in the air, each followed by his boy with basket and generally useless landing net. 'Competition' and 'the greatest happiness of the greatest number' are not heard of in this antique domain. A day's fishing at Cheneys means a day by the best water in England in the fisherman's paradise of solitude.

Such a day's privilege had been extended to me if I cared to avail myself of it, when I was coming down to see the chapel, and though my sporting days were over, and gun and rod had long lain undisturbed in their boxes, yet neither the art of fly-fishing, nor the enjoyment of it when once acquired and tasted, will leave us except with life.

bushes are, how near the casting line approaches them. If a gust of wind twists it into a heap, or sweeps it towards a dangerous bough, the wrist does something on the instant which sends the fly straight and unharmed into the water. Practice gives our different organs functions like the instinct of animals, who do what their habits require, yet know not what they do.

The small fish take freely—some go back into the water, the few in good condition into the basket, which, after a field or two, becomes perceptibly heavier. The governor, a small humble bee, used to be a good fly at Cheneys, and so did the black alder. Neither of them is of any use to-day. The season has been cold and late. The March brown answers best, with the never-failing red spinner. After running rapidly through two or three meadows, the river opens into a broad smooth shallow, where the trout are larger, and the water being extremely clear, are specially difficult to catch. In such a place as this, it is useless to throw your fly at random upon the stream. You must watch for a fish which is rising, and you must fish for him till you either catch him or disturb him. It is not enough to go below him and throw upwards, for though he lies with his head up-stream, his projecting eye looks back over his shoulders. You must hide behind a bunch of rushes. You must crawl along the grass with one arm only raised. If the sun is shining and the shadow of your rod glances over the gravel, you may get up and walk away. No fish within sight will stir then to the daintiest cast.

I see a fish close to the bank on the opposite side, lazily lifting his head as a fly floats past him. It is a long throw, but the wind is fair and he is worth an effort—once, twice, three times I fail to reach him. The fourth I land the fly on the far bank, and draw it gently off upon his very nose. He swirls in the water like a salmon as he sweeps round to seize it. There is a splash—a sharp jerk, telling unmistakably that something has given way. A large fish may break you honestly in weeds or round a rock or stump, and only fate is to blame, but to let yourself be broken on the first strike is unpardonable. What can have happened? Alas, the red-spinner has snapped in two at the turn—a new fly bought last week at ——'s, whose boast it has been that no fly of his was ever known to break or bend.

One grumbles on these occasions, for it is always the best fish which one loses; and as imagination is free, one may call him what weight one pleases.

The damage is soon repaired. The basket fills fast as trout follows trout. It still rains, and I begin to think that I have had enough of it. I have promised to be at the mill at midday, and then we shall see.

Evidently the sky means mischief. Black thunder-clouds pile up to windward, and heavy drops continue falling. But there is a break in the south as I walk back by the bank—a gleam of sunshine spans the valley with a rainbow, and an actual May-fly or two sails by which I see greedily swallowed. The keeper is waiting; he looks scornfully into my basket. Fish—did I call these herrings fish? I must try the upper water at all events. The large trout were feeding, but the fly was not yet properly on—we can have our luncheon first.

How pleasant is luncheon on mountain-side or river's bank, when you fling yourself down on fern or heather after your morning's work, and no daintiest *entrée* had ever such flavour as your sandwiches, and no champagne was ever so exquisite as the fresh stream water just tempered from your whisky flask. Then follows the smoke, when the keeper fills his pipe at your bag, and old adventures are talked over, and the conversation wanders on through anecdotes and experiences, till, as you listen to the shrewd sense and kindly feeling of your companion, you become aware that the steep difference which you had imagined to be created by education and habits of life had no existence save in your own conceit. Fortune is less unjust than she seems, and true hearts and clear-judging healthy minds are bred as easily in the cottage as the palace.

But time runs on, and I must hasten to the end of my story. The short respite from the wet is over. Down falls the rain again; rain not to be measured by inches, but by feet; rain such as has rarely been seen in England before this 'æstas mirabilis' of 1879. It looks hopeless, but the distance by the road to the top of the water is not great. We complain if we are caught in a shower; we splash along in a deluge, in boots and waterproof, as composedly as if we were seals or otters. The river is rising and, as seldom happens with a chalk stream, it is growing discoloured. Every lane is running with a brown stream, which finds its way at last into the main channel. The highest point is soon reached. The first hundred yards are shallow, and to keep the cattle from straying a high iron railing runs along the bank. Well I know that iron railing. You must stand on the lower bar to fish over it. If you hook a trout, you must play him from that uneasy perch in a rapid current among weeds and stones, and your attendant must use his landing net through the bars. Generally it is the liveliest spot in the river, but nothing can be done there to-day. There is a ford immediately above, into which the thick road-water is pouring, and the fish cannot see the fly. Shall we give it up? Not yet. Further down the mud settles a little, and by this time even the road has been washed clean, and less dirt comes off it. The flood stirs the trout into life and hunger, and their eyes, accustomed to the transparency of the chalk water, do not see you so quickly.

Below the shallow there is a pool made by a small weir, over which the flood is now rushing—on one side there is an open hatchway, with the stream pouring through. The banks are bushy, and over the deepest part of the pool the stem of a large ash projects into the river. Yesterday, when the water was lower, the keeper saw a four-pounder lying under that stem. Between the weir and the trees it is an awkward spot, but difficulty is the charm of fly-fishing. The dangerous drop fly must be taken off; a drop fly is only fit for open water, where there is neither weed nor stump. The March brown is sent skimming at the tail of the casting line, to be dropped, if possible, just above the ash, and to be carried under it by the stream. It has been caught in a root, so it seems; or it is foul somewhere. Surely no fish ever gave so dead a pull. No; it is no root. The line shoots under the bank. There is a broad flash of white just below the surface a moment's struggle, the rod springs straight, and the line comes back unbroken. The March brown is still floating at the end of it. It was a big fish, perhaps the keeper's very big one; he must have been lightly hooked, and have rubbed the fly out of his mouth.

But let us look closer. The red-spinner had played false in the morning; may not something like it have befallen the March brown? Something like it, indeed. The hook has straightened out as if, instead of steel, it had been made of copper. A pretty business! I try another, and another, with the same result. The heavy trout take them, and one bends and the next breaks. Oh! ———! Well for Charles Kingsley that he was gone before he heard of a treason which would have broken his trust in man. You, in whose praise I have heard him so often eloquent! You who never dealt in shoddy goods. You who were faithful if all else were faithless, and redeemed the credit of English tradesmen! You had not then been in the school of progress customers with cheap and nasty wares, fair-looking to the eye and worthless to the touch and trial. In those days you dealt with gentlemen, and you felt and traded like a gentleman yourself. And now you too, have gone the way of your fellows. You are making a fortune, as you call it, out of the reputation which you won honourably in better days. You have given yourself over to competition and semblance. You have entered for the race among the sharpers and will win by knavery and tricks like the rest. I will not name you for the sake of the old times, when C. K. and I could send you a description of a fly from the furthest corner of Ireland, and by return of post would come a packet tied on hooks which Kendal and Limerick might equal, but could not excel. You may live on undenounced for me; but read C. K.'s books over again; repent of your sins, go back to honest ways, and renounce the new gospel in which whosoever believes shall not be saved.

But what is to be done? Spite of the rain the river is now covered with drowned May-flies, and the trout are taking them all round. I have new May-flies from the same quarter in my book, but it will be mere vexation to try them. Luckily for me there are a few old ones surviving from other days. The gut is brown with age—but I must venture it. If this breaks I will go home, lock away my rod, and write an essay on the effects of the substitution of Political Economy for the Christian faith.

On, then, goes one of these old flies. It looks well. It bears a mild strain, and, like Don Quixote with his helmet, I will not put it to a severe trial. Out it shoots over the pool, so natural-looking that. I cannot distinguish it from a real fly which floats at its side. I cannot, nor can that large trout in the smooth water above the fall. He takes it, springs into the air, and then darts at the weir to throw himself over. If he goes down he is lost Hold on. He has the stream to help him, and not an inch of line can be spared. The rod bends double, but the old gut is true. Down the fall he is not to go. He turns up the pool, he makes a dart for the hatchway,—but if you can stand a trout's first rush you need not fear him in fair water afterwards. A few more efforts and he is in the net and on the bank, not the keeper's four-pounder, but a handsome fish, which I know that he will approve.

He had walked down the bank pensively while

I was in the difficulty with my flies, meditating, perhaps, on idle gentlemen, and reflecting that if the tradesmen were knaves the gentlemen were correspondingly fools. He called to me to come to him just as I had landed my trout. He was standing by the side of the rapid stream at the head of the mill pool. It was as he had foretold; the great fish had come up, and were rolling like salmon on the top of the water gulping down the May-flies. Even when they are thus carelessly ravenous, the clearness of the river creates a certain difficulty in catching them in ordinary times, but to-day the flood made caution superfluous. They were splashing on the surface close to our feet, rolling about in a negligent gluttony which seemed to take from them every thought of danger, for a distance of at least three hundred yards.

There was no longer any alarm for the tackle, and it was but to throw the fly upon the river, near or far, for a trout instantly to seize it. There was no shy rising where suspicion balks the appetite. The fish were swallowing with a deliberate seriousness every fly which drifted in their reach, snapping their jaws upon it with a gulp of satisfaction. The only difficulty was in playing them when hooked with a delicate chalk-stream casting-line. For an hour and a half it lasted, such an hour and a half of trout fishing as I had never seen and shall never see again. The ease of success at last became wearisome. Two large baskets were filled to the brim. Accident had thrown in my way a singular opportunity which it would have been wrong to abuse, so I decided to stop. We emptied out our spoils upon the grass, and the old keeper said that long as he had known the river he had never but once seen so many fish of so large size taken in the Ches in a single day by a single rod.

How can a reasonable creature find pleasure in having performed such an exploit? If trout were wanted for human food, a net would have answered the purpose with less trouble to the man and less annoyance to the fish. Throughout creation man is the only animal—man, and the dogs and cats which have learnt from him—who kills, for the sake of killing, what he does not want, and calls it sport. All other animals seize their prey only when hungry, and are satisfied when their hunger is appeased.

Such, it can only be answered, is man's disposition. He is a curiously formed creature, and the appetite for sport does not seem to disappear with civilization. The savage in his natural state hunts, as the animals hunt, to support his life; the sense of sport is strongest in the elaborately educated and civilized. It may be that the taste will die out before 'Progress.' Our descendants perhaps, a few generations hence, may look back upon a pheasant battue as we look back on bear-baiting and bull-fighting, and our mild offspring, instructed in the theory of development, may see a proof in their fathers' habits that they come of a race who were once crueller than tigers, and will congratulate themselves on the change. So they will think, if they judge us as we judge our forefathers of the days of the Plantagenets and Tudors, and both we and they may be perhaps mistaken. Half the lives of men in mediæval Europe was spent in fighting. Yet from mediæval Europe came the knightly graces of courtesy and chivalry. The modern soldier, whose trade is war, yet hates and dreads war more than civilians dread it. The sportsman's knowledge of the habits of animals gives him a kindly feeling towards them notwithstanding, and sporting tends rather to their preservation than their destruction. The human race may become at last vegetarians and water-drinkers. Astræa may come back, and man may cease to take the life of bird, or beast, or fish. But the lion will not lie down with the lamb, for lambs and lions will no longer be; the eagle will not feed beside the dove, for doves will not be allowed to consume grain which might have served as human food, and will be extinct as the dodo. It may be all right and fit and proper: a world of harmless vegetarians may be the appropriate outcome of the development of humanity. But we who have been born in a ruder age do not aspire to rise beyond the level of our own times. We have toiled, we have suffered, we have enjoyed, as the nature which we have received has prompted us. We blame our fathers' habits; our children may blame ours in turn; yet we may be sitting in judgment, both of us, on matters of which we know nothing.

The storm has passed away, the dripping trees are sparkling in the warm and watery sunset. Back, then, to our inn, where dinner waits for us, the choicest of our own trout, pink as salmon, with the milky curd in them, and no sauce to spoil the delicacy of their flavour. Then bed, with its lavender-scented sheets and white curtains, and sleep, sound sweet sleep, that loves the country village and comes not near a London bedroom. In the morning, adieu to Cheneys, with its red gable-ends and chimneys, its venerable trees, its old-world manners, and the solemn memories of its mausoleum.

Adieu, too, to the river, which, 'though men may come and men may go,' has flowed and will flow on for ever, winding among its reed beds, murmuring over its gravelly fords, heedless of royal dynasties, uncaring whether Cheney or Russell calls himself lord of its waters, graciously turning the pleasant corn mills in its course, unpolluted by the fetid refuse of manufactures, and travelling on to the ocean bright and pure and uncharged with poison, as in the old times when the priest sung mass in the church upon the hill and the sweet soft matins bell woke the hamlet to its morning prayers.

A SIDING AT A RAILWAY STATION.

[*FRASER'S MAGAZINE. 1879.*]

SOME years ago I was travelling by railway, no matter whence or whither. I was in a second-class carriage. We had been long on the road, and had still some distance before us, when one evening our journey was brought unexpectedly to an end by the train running into a siding. The guards opened the doors, we were told that we could proceed no further, and were required to alight. The passengers were numerous, and of all ranks and sorts. There were third class, second, first, with saloon carriages for several great persons of high distinction. We had ministers of state, judges on circuit, directors, leading men of business, idle young men of family who were out amusing themselves, an archbishop, several ladies, and a duke and duchess with their suite. These favoured travellers had Pullman cars to themselves and occupied as much room as was allotted to scores of plebeians. I had amused myself for several days in observing the luxurious appurtenances by which they were protected against discomfort—the piles of cushions and cloaks, the baskets of dainties, the novels and magazines to pass away the time, and the profound attention which they met with from the conductors and station-masters on the line. The rest of us were a miscellaneous crowd—commercial people, lawyers, artists, men of letters, tourists moving about for pleasure or because they had nothing to do; and in the third-class carriages, artisans and labourers in search of work, women looking for husbands or for service, or beggars flying from starvation in one part of the world to find it follow them like their shadows, let them go where they pleased. All these were huddled together, feeding hardly on such poor provisions as they carried with them or could pick up at the stopping-places. No more consideration was shown them than if they had been so many cattle. But they were merry enough: songs and sounds of laughter came from their windows, and notwithstanding all their conveniences, the languid-looking fine people in the large compartments seemed to me to get through their journey with less enjoyment after all than their poor fellow-travellers. These last appeared to be of tougher texture, to care less for being jolted and shaken, to be better-humoured and kinder to one another. They had found life go hard with them wherever they had been, and not being accustomed to have everything which they wished for, they were less selfish and more considerate.

The intimation that our journey was for the present at an end came on most of us as an unpleasant surprise. The grandees got out in a high state of indignation. They called for their servants, but their servants did not hear them, or laughed and passed on. The conductors had forgotten to be obsequious. All classes on the platform were suddenly on a level. A beggar-woman hustled the duchess as she was standing astonished because her maid had left her to carry her own bag. The patricians were pushed about among the crowd with no more concern than if they had been common mortals. They demanded loudly to see the station-master. The minister complained angrily of the delay; an important negotiation would be imperilled by his detention, and he threatened the company with the displeasure of his department. A consequential youth who had just heard of the death of his elder brother was flying home to take his inheritance. A great lady had secured, as she had hoped, a brilliant match for her daughter; her work over, she had been at the baths to recover from the dissipation of the season; difficulty had risen unlooked for, and unless she was at hand to remove it, the worst consequences might be feared. A banker declared that the credit of a leading commercial house might fail unless he could be at home on the day fixed for his return: he alone could save it. A solicitor had the evidence in his portmanteau which would determine the succession to the lands and title of an ancient family. An elderly gentleman was in despair about his young wife, whom he had left at home; he had made a will by which she was to lose his fortune if she married again after his death, but the will was lying in his desk unsigned. The archbishop was on his way to a synod where the great question was to be discussed whether gas might be used at the altar instead of candles. The altar candles were blessed before they were used, and the doubt was whether gas could be blessed. The right reverend prelate conceived that if the gas tubes were made in the shape of candles the difficulty could be got over, but he feared that without his moderating influence the majority might come to a rash decision. All these persons were clamouring over their various anxieties with the most naïve frankness, the truth coming freely out whatever it might be. One distinguished-looking lady in deep mourning, with a sad gentle face, alone was resigned and hopeful. It seemed that her husband had been stopped not long before at the same station. She thought it possible that she might meet him again.

The station-master listened to the complaints with composed indifference. He told the loudest that they need not alarm themselves. The State would survive the absence of the minister. The minister, in fact, was not thinking of the State at all, but of the party triumph which he expected; and the peerage which was to be his reward, the station-master said would now be of no use to him. The youth had a second brother who would succeed instead of him, and the tenants would not be inconvenienced by the change. The fine lady's daughter would marry to her own liking instead of her mother's, and would be all the happier for it. The commercial house was already insolvent, and the longer it lasted the more innocent people would be ruined by it. The boy whom the lawyer intended to make into a rich baronet was now working industriously at school, and would grow up a useful man. If a great estate fell in to him he would be idle and dissolute. The old man might congratulate himself that he had escaped so soon from the scrape into which he had fallen. His wife would marry an adventurer, and would suffer worse from inheriting his fortune. The archbishop was commended for his anxiety. His solution of the candle problem was no doubt an excellent one; but his clergy were now provided with a harmless subject to quarrel over, and if it was adopted they might fall out over something else which might be seriously mischievous.

'Do you mean, then, that you are not going to send us forward at all?' the minister inquired sternly.

'You will see,' the station-master answered with a curious short laugh. I observed that he looked more gently at the lady in mourning. She had said nothing, but he knew what was in her mind, and though he held out no hope in words that her wish would be gratified, he smiled sadly, and the irony passed out of his face.

The crowd, meanwhile, were standing about the platform whistling tunes or amusing themselves, not ill-naturedly, at the distress of their grand companions. Something considerable was happening.

But they had so long experienced the ups and downs of things that they were prepared for what fortune might send. They had not expected to find a Paradise where they were going, and one place might be as good as another. They had nothing belonging to them except the clothes they stood in and their bits of skill in their different trades. Wherever men were, there would be need of cobblers and tailors, and smiths and carpenters. If not, they might fall on their feet somehow if there was work to be done of any sort.

Presently a bell rang, a door was flung open, and we were ordered into a waiting-room, where we were told that our luggage was to be examined. It was a large barely furnished apartment, like the *salle d'attente* at the Northern Railway Station at Paris. A rail ran across, behind which we were all penned; opposite to us was the usual long table, on which were piled boxes, bags, and portmanteaus, and behind them stood a row of officials, in a plain uniform with gold bands round their caps, and the dry peremptory manner which passengers accustomed to deference so particularly dislike. At their backs was a screen extending across the room, reaching half way to the ceiling; in the rear of it there was apparently an office.

We each looked to see that our particular belongings were safe, but we were surprised to find that we could recognize none of them. Packages there were in plenty, alleged to be the property of the passengers who had come in by the train. They were arranged in the three classes—first, second, and third—but the proportions were inverted: most of it was labelled as the luggage of the travellers in fustian, who had brought nothing with them but what they carried in their hands; a moderate heap stood where the second-class luggage should have been, and some of superior quality, but none of us could make out the shape of our own trunks. As to the grand ladies and gentlemen, the innumerable articles which I had seen put as theirs into the van were nowhere to be found. A few shawls and cloaks lay upon the planks, and that was all. There was a loud outcry, but the officials were accustomed to it, and took no notice. The station-master, who was still in charge of us, said briefly that the saloon luggage would be sent forward in the next train. The late owners would have no more use for it, and it would be delivered to their friends.

The late owners! Were we no longer actual owners, then? My individual loss was not great, and, besides, it might be made up to me, for I saw

M. R. JAYAKAR
MALABAR HILL
BOMBAY

my name on a strange box on the table, and being of curious disposition, the singularity of the adventure made it interesting to me. The consternation of the rest was indescribable. The minister supposed that he had fallen among Communists, who disbelieved in property, and was beginning a speech on the elementary conditions of society, when silence was called, and the third-class passengers were called to advance, that their boxes might be opened. Each man had his own carefully docketed. The lids flew off, and within, instead of clothes and shoes and dressing apparatus and money and jewels and such like, were simply samples of the work which he had done in his life. There was an account-book also, in which was entered the number of days which he had worked, the number and size of the fields, &c., which he had drained and enclosed and ploughed, the crops which he had reaped, the walls which he had built, the metal which he had dug out and smelted and fashioned into articles of use to mankind, the leather which he had tanned, the clothes which he had woven—all entered with punctual exactness; and on the opposite page, the wages which he had received, and the share which had been allotted to him of the good things which he had helped to create.

Besides his work, so specifically called, there were his actions—his affection for his parents, or his wife and children, his self-denials, his charities, his purity, his truth, his honesty, or, it might be, ugly catalogues of sins and oaths and drunkenness and brutality. But inquiry into action was reserved for a second investigation before a higher commissioner. The first examination was confined to the literal work done by each man for the general good—how much he had contributed, and how much society had done for him in return; and no one, it seemed, could be allowed to go any further without a certificate of having passed this test satisfactorily. With the workmen, the balance in most instances was found enormously in their favour. The state of the case was so clear that the scrutiny was rapidly got over, and they and their luggage were passed in to the higher court. A few were found whose boxes were empty, who had done nothing useful all their lives, and had subsisted by begging and stealing. These were ordered to stand aside till the rest of us had been disposed of.

The saloon passengers were taken next. Most of them, who had nothing at all to show, were called up together, and were asked what they had to say for themselves. A well-dressed gentleman who spoke for the rest, said that the whole investigation was a mystery to him. He and his friends had been born to good fortunes, and had found themselves on entering upon life, amply provided for. They had never been told that work was required of them, either work with their hands or work with their heads—in fact, work of any kind. It was right, of course, for the poor to work, because they could not honestly live otherwise. For themselves, they had spent their time in amusements, generally innocent They had paid for everything which they had consumed. They had stolen nothing, taken nothing from any man by violence or fraud. They had kept the commandments, all ten of them, from the time when they were old enough to understand them. The speaker, at least, declared that he had no breach of any commandment on his own conscience, and he believed he might say as much of his companions. They were superior people, who had been always looked up to and well spoken of, and to call upon them to show what they had done was against reason and equity.

'Gentlemen,' said the chief official, 'we have heard this many times; yet as often as it is repeated we feel fresh astonishment. You have been in a world where work is the condition of life. Not a meal can be had by any man that some one has not worked to produce. Those who work deserve to eat; those who do not work deserve to starve. There are but three ways of living: by working, by stealing, or by begging. Those who have not lived by the first have lived by one of the other two. And no matter how superior you think yourselves, you will not pass here till you have something of your own to produce. You have had your wages beforehand—ample wages, as you acknowledge yourselves. What have you to show?'

'Wages!' the speaker said. 'We are not hired servants; we received no wages. What we spent was our own. All the orders we received were that we were not to do wrong. We have done no wrong. I appeal to the higher court.'

But the appeal could not be received. To all who presented themselves with empty boxes, no matter who they were, or how excellent their characters appeared to one another, there was the irrevocable answer, 'No admittance, till you come better furnished.' All who were in this condition, the duke and duchess among them, were ordered to stand aside with the thieves. The duchess declared that she had given the finest parties in the season, and as it was universally agreed that they had been the most tedious, and that no one had found any pleasure there, a momentary doubt rose whether they might not have answered some useful purpose in disgusting people with such modes of entertainment; but no evidence of this was forthcoming: the world had attended them because the world had nothing else to do; and she and her guests had been alike unprofitable. Thus the large majority of the saloon passengers was disposed of. The minister, the archbishop, the lawyer, the banker, and others, who, although they had no material work credited to them, had yet been active and laborious in their different callings, were passed to the superior judges.

Our turn came next—ours of the second class—and a motley gathering we were. Busy we must all have been, from the multitude of articles which we found assigned to us. Manufacturers with their wares, solicitors with their lawsuits, doctors and clergymen with the bodies and souls which they had saved or lost, authors with their books, painters and sculptors with their pictures and statues. But the hard test was applied to all that we had produced—the wages which we had received on one side, and the value of our exertions to mankind on the other—and imposing as our performances looked when laid out to be examined, we had been paid, most of us, out of all proportion to what we were found to have deserved. I was reminded of a large compartment in the Paris Exhibition where an active gentleman, wishing to show the state of English literature, had collected copies of every book, review, pamphlet, or newspaper which had been published in a single year. The bulk was overwhelming, but the figures were only decimal points, and the worth of the whole was a fraction above zero. A few of us were turned back summarily among the thieves and the fine gentlemen and ladies—speculators who had done nothing but handle money which had clung to their fingers in passing through them, divines who had preached a morality which they did not practise, and fluent orators who had made speeches which they knew to be nonsense, philosophers who had spun out of moonshine systems of the universe, distinguished pleaders who had defeated justice while they established points of law, writers of books upon subjects of which they knew enough to mislead their readers, purveyors of luxuries which had added nothing to human health or strength, physicians and apothecaries who had pretended to knowledge which they knew that they did not possess,—these all, as the contents of their boxes bore witness against them, were thrust back into the rejected herd.

There were some whose account stood better as having at least produced something of real merit, but they were cast on the point of wages; modest excellence had come badly off; the plausible and unscrupulous had thriven and grown rich. It was tragical, and evidently a surprise to most of us, to see how mendacious we had been: how we had sanded our sugar, watered our milk, scamped our carpentering and mason's work, literally and metaphorically; how in all things we had been thinking less of producing good work than of the profit which we could make out of it; how we had sold ourselves to tell lies and act them, because the public found lies pleasant and truth expensive and troublesome. Some of us were manifest rogues who had bought cheap and sold dear, had used false measures and weights, had made cotton pass for wool, and hemp for silk, and tin for silver. The American pedlar happened to be in the party who had put a rind upon a grindstone and had sold it as a cheese. These were promptly sifted out and placed with their fellows; only persons whose services were on the whole greater than the pay which they had received were allowed their certificates. When my own box was opened, I perceived that though the wages had been small the work done seemed smaller still, and I was surprised to find myself among those who had passed.

The whistle of a train was heard at this moment coming in upon the main line. It was to go on in half an hour, and those who had been turned back were told that they were to proceed by it to the place where they had been originally going. They looked infinitely relieved at the news; but, before they started, a few questions had to be put to them, and a few alterations made which were to affect their future. They were asked to explain how they had come to be such worthless creatures. They gave many answers, which came mainly to the same thing. Circumstances had been against them. It was all owing to circumstances. They had been badly brought up. They had been placed in situations where it had been impossible for them to do better. The rich people repeated that they had never been informed that any work was expected of them. Their wants had all been provided for, and it was unfair to expect that they should have exerted themselves of their own accord when they had no motive for working. If they had only been born poor all would have gone well with them. The cheating tradesman declared that the first duty of a shopkeeper, according to all received principles, was to make money and better his condition. It was the buyer's business to see to the quality of the articles which he purchased; the shopkeeper was entitled to sell his wares at the highest price which he could get for them. So, at least, it was believed and taught by the recognized authorities on the subject. The orators, preachers, newspaper writers, novel writers, &c. &c., of whom there were a great many, appealed to the crowds who came to listen to them or bought and read their productions. *Tout le monde*, it was said, was wiser than the wisest single sage. They had given the world what the world wished for and approved; they had worked at supplying it with all their might, and it was extremely hard to blame them for guiding themselves by the world's judgment. The thieves and vagabonds argued that they had been brought into existence without their consent being asked: they had not wished for it; although they had not been without their pleasures, they regarded existence on the whole as a nuisance which they would gladly have been spared. Being alive, however, they had to keep alive; and for all that they could see, they had as full a right to the good things which the world contained as anybody else, provided they could get them. They were called thieves. Law and language were made by the property owners, who were their natural enemies. If society had given them the means of living honestly they would have found it easy to be honest. Society had done nothing for them—why should they do anything for society?

So, in their various ways, those who had been 'plucked' defended themselves. They were all delighted to hear that they were to have another chance; and I was amused to observe that though some of them had pretended that they had not wished to be born, and had rather not have been born, not one of them protested against being sent back. All they asked was that they should be put in a new position, and that the adverse influences should be taken off. I expected that among these adverse influences they would have mentioned the faults of their own dispositions. My own opinion had been that half the misdoings of men came from congenital defects of character which they had brought with them into the world, and that constitutional courage, right-mindedness, and practical ability were as much gifts of nature or circumstance as the accidents of fortune. A change in this respect was of more consequence than in any other. But with themselves they were all apparently satisfied, and they required only an improvement in their labourer's cottage. She was to attend the village school, and rise thence into a housemaid. The fine gentleman was made a ploughboy. The authors and preachers were to become mechanics, and bound apprentices to carpenters and blacksmiths. A philosopher who, having had a good fortune and unbroken health, had insisted that the world was as good as it could be made, was to be born blind and paralytic, and to find his way through life under the new conditions. The thieves and cheats, who pretended that their misdemeanours were due to poverty, were to find themselves, when they arrived in the world again, in palaces surrounded with luxury. The cup of Lethe was sent round. The past became a blank. They were hurried into the train; the engine screamed and flew away with them.

'They will be all here again in a few years,' the station-master said, 'and it will be the same story over again. I have had these very people in my hands a dozen times. They have been tried in all positions, and there is still nothing to show, and nothing but complaints of circumstances. For my part I would put them out altogether.' 'How long is it to last?' I asked. 'Well,' he said, 'it does not depend on me. No one passes here who cannot prove that he has lived to some purpose. Some of the worst I have known made at last into pigs and geese, to be fatted up and eaten, and made of use in that way. Others have become asses, condemned to carry burdens, to be beaten with sticks, and to breed asses like themselves for a hundred generations. All animated creatures tend to take the shape at last which suits their character.'

The train was scarcely out of sight when again the bell rang. The scene changed as at a theatre. The screen was rolled back, and we who were left found ourselves in the presence of four grave-looking persons like the board of examiners whom we remembered at college. We were called up one by one. The work which had passed the first ordeal was again looked into, and the quality of it compared with the talent or faculty of the producer, to see how far he had done his best; whether anywhere he had done worse than he might have done and knew how to have done; while besides, in a separate collection, were the vices, the sins, the selfishnesses and ill-humours, with, in the other scale, the acts of personal duty, of love and kindness and charity, which had increased the happiness or lightened the sorrows of those connected with him. These last, I observed, had generally been forgotten by the owner, who saw them appear with surprise, and even repudiated them with protest. In the work, of course, both material and moral, there was every gradation both of kind and merit. But while nothing was absolutely worthless, everything, even the highest achievements of the greatest artist or the greatest saint, fell short of absolute perfection. Each of us saw our own performances, from our first ignorant beginnings to what we regarded as our greatest triumph ; and it was easy to trace how much of our faults were due to natural deficiencies and the necessary failures of inexperience, and how much to self-will or vanity or idleness. Some taint of mean motives, too, some desire of reward, desire of praise or honour or wealth, some foolish self-satisfaction, when satisfaction ought not to have been felt, was to be seen infecting everything, even the very best which was presented for scrutiny.

So plain was this that one of us, an earnest, impressive-looking person, whose own work bore inspection better than that of most of us, exclaimed passionately that, so far as he was concerned, the examiners might spare their labour. From his earliest years he had known what he ought to do, and in no instance had he ever completely done it. He had struggled; he had conquered his grosser faults; but the farther he had gone, and the better he had been able to do, his knowledge had still grown faster than his power of acting upon it; and every additional day that he had lived, his shortcomings had become more miserably plain to him. Even if he could have reached perfection at last, he could not undo the past, and the faults of his youth would bear witness against him and call for his condemnation. Therefore, he said, he abhorred himself. He had no merit which could entitle him to look for favour. He had laboured on to the end, but he had laboured with a full knowledge that the best which he could offer would be unworthy of acceptance. He had been told, and he believed, that a high spirit, not subject to infirmity, had done his work for him, and done it perfectly, and that if he abandoned all claim on his own account, he might be accepted for the sake of what another had done. This, he trusted, was true, and it was his sole dependence. In the so-called good actions with which he seemed to be credited, there was nothing that was really good; there was not one which was altogether what it ought to have been.

He was evidently sincere, and what he said was undoubtedly true—true of him and true of every one. Even in the vehemence of his self-abandonment a trace lingered of the taint which he was confessing, for he was a polemical divine; he had spent his life and gained a reputation in maintaining this particular doctrine. He believed it, but he had not forgotten that he had been himself its champion.

The examiner looked kindly at him; but answered, 'We do not expect impossibilities; and we do not blame you when you have not accomplished what is beyond your strength. Only those who are themselves perfect can do anything perfectly. Human beings are born ignorant and helpless. They bring into the world with them a disposition to seek what is pleasant to themselves, and what is pleasant is not always right. They learn to live as they learn everything else. At first they cannot do rightly at all. They improve under teaching and practice. The best only arrive at excellence. We do not find fault with the painter on account of his first bad copies if they were as good as could be looked for at his age. Every craftsman acquires his art by degrees. He begins badly; he cannot help it; and it is the same with life. You learn to walk by falling down. You learn to live by going wrong and experiencing the consequences of it. We do not record against a man "the sins of his youth" if he has been honestly trying to improve himself. We do not require the same self-control in a child as in a man. We do not require the same attainments from all. Some are well taught, some are ill taught, some are not taught at all. Some have naturally good dispositions, some have naturally bad dispositions. Not one has had power "to fulfil the law," as you call it, completely. Therefore, it is no crime in him if he fails. We reckon as faults those only which arise from idleness, wilfulness, selfishness, and deliberate preference of evil to good. Each is judged according to what he has received.'

I was amused to observe how pleased the archbishop looked while the examiner was speaking. He had himself been engaged in controversy with this gentleman on the share of 'good works' in justifying a man, and if the examiner had not taken his side in the discussion he had at least demolished his adversary. The archbishop had been the more disinterested in the line which he had taken, as his own 'works,' though in several large folios, weighed extremely little; and, indeed, had it not been for passages in his early life—he had starved himself at college that he might not be a burden upon his widowed mother—I do not know but that he might have been sent back into the world to serve as a parish clerk.

For myself, there were questions which I was longing to ask, and I was trying to collect my courage to speak. I wanted chiefly to know what the examiner meant by 'natural disposition.' Was it that a man might be born with a natural capacity for becoming a saint, as another man with a capacity to become a great artist or musician, and that each of us could only grow to the limits of his natural powers? and, again, were idleness, wilfulness, selfishness, &c. &c., natural dispositions?—for in that case——

But at the moment the bell rang again and my own name was called. There was no occasion to ask who I was. In every instance the identity of the person, his history, small or large, and all that he had said or done, was placed before the court so clearly that there was no need for extorting a confession. There stood the catalogue inexorably impartial, the bad actions in a schedule painfully large, the few good actions veined with personal motives which spoilt the best of them. In the way of work there was nothing to be shown but certain books and other writings, and these were spread out to be tested. A fluid was poured on the pages, the effect of which was to obliterate entirely every untrue proposition, and to make every partially true proposition grow faint in proportion to the false element which entered into it. Alas! chapter after chapter vanished away, leaving the paper clean as if no compositor had ever laboured in setting type for it. Pale and illegible became the fine-sounding paragraphs on which I had secretly prided myself. A few passages, however, survived here and there at long intervals. They were those on which I had laboured least and had almost forgotten, or those, as I observed in one or two instances, which had been selected for special reprobation in the weekly journals. Something stood to my credit, and the worst charge of wilfully and intentionally setting down what I did not believe to be true was not alleged against me. Ignorance, prejudice, carelessness; sins of infirmity—culpable indeed, but not culpable in the last degree; the water in the ink, the commonplaces, the ineffectual sentiments; these, to my unspeakable comfort, I perceived were my heaviest crimes. Had I been accused of absolute worthlessness, I should have pleaded guilty in the state of humiliation to which I was reduced; but things were better than they might have been. I was flattering myself that when it came to the wages question, the balance would be in my favour: so many years of labour—such and such cheques received from my publisher. Here, at least, I held myself safe, and I was in good hope that I might scrape through. The examiner was good-natured in his manner. A reviewer who had been listening for my condemnation was beginning to look disgusted, when suddenly one of the walls of the court became transparent, and there appeared an interminable vista of creatures—creatures of all kinds from land and water, reaching away into the extreme distance. They were those which in the course of my life I had devoured, either in part or whole, to sustain my unconscionable carcass. There they stood in lines with solemn and reproachful faces—oxen and calves, sheep and lambs, deer, hares, rabbits, turkeys, ducks, chickens, pheasants, grouse, and partridges, down to the larks and sparrows and blackbirds, which I had shot when a boy and made into puddings. Every one of them had come up to bear witness against their murderer; out of sea and river had come the trout and salmon, the soles and turbots, the ling and cod, the whiting and mackerel, the smelts and whitebait, the oysters, the crabs, the lobsters, the shrimps. They seemed literally to be in millions, and I had eaten them all. I talked of wages. These had been my wages. At this enormous cost had my existence been maintained. A stag spoke for the rest. 'We all,' he said, 'were sacrificed to keep this cormorant in being, and to enable him to produce the miserable bits of printed paper which are all that he has to show for himself. Our lives were dear to us. In meadow and wood, in air and water, we wandered harmless and innocent, enjoying the pleasant sunlight, the light of heaven and the sparkling waves; we were not worth much; we have no pretensions to high qualities. If the person who stands here to answer for himself can affirm that his value in the universe was equivalent to the value of all of us who were sacrificed to feed him, we have no more to say. Let it be so pronounced. We shall look at our numbers, and we shall wonder at the judgment, though we shall withdraw our complaint. But for ourselves we say freely that we have long watched him—him and his fellows—and we have failed to see in what the superiority of the human creature lies. We know him only as the most cunning, the most destructive, and, unhappily the longest-lived of all carnivorous beasts. His delight is in killing. Even when his hunger is satisfied he kills us for his mere amusement.'

The oxen lowed approval, the sheep bleated, the birds screamed, the fishes flapped their tails. I, for myself, stood mute and self-condemned. What answer but one was possible? Had I been myself on the bench I could not have hesitated. The fatal sentence of condemnation was evidently about to be uttered when the scene became indistinct, there was a confused noise, a change of condition, a sound of running feet and of many voices. I awoke; I was again in the railway carriage; the door was thrown open; porters entered to take our things. We stepped out upon the platform. We were at the terminus for which we had been originally destined. Carriages and cabs were waiting; tall, powdered footmen flew to the assistance of the duke and duchess. The station-master was standing hat in hand and obsequiously bowing; the minister's private secretary had come to meet his right honourable chief with the red despatch-box, knowing the impatience with which it was waited for. The duke shook hands with the archbishop before he drove away. 'Dine with us to-morrow?' he said. 'I have had a very singular dream. You shall be my Daniel and interpret it for me.' The archbishop regretted infinitely that he must deny himself the honour; his presence was required at the Conference. 'I, too, have dreamt,' he said; 'but with your Grace and me the realities of this world are too serious to leave us leisure for the freaks of imagination.'

THE END.

Richard Clay & Sons, Limited, London & Bungay.